GOLDWIN SMITH.

ON THE DIFFERENCE

BETWEEN

PHYSICAL AND MORAL LAW

THE FERNLEY LECTURE OF 1883

BY

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TO

JAMES LINDSAY

THE BEST OF BROTHERS-IN-LAW

THIS VOLUME

WRITTEN IN GREAT PART UNDER HIS ROOF

IS

Affectionately Inscribed

PREFACE.

This attempt to treat of some deep questions of our own time in language as far as possible freed from technicalities, may claim a liberal measure of the indulgence which is generally accorded to similar attempts. Through circumstances the work has been done at a distance not only from public libraries, but even from my own; and done for a good part of the time under considerable physical disabilities. In putting together the thoughts of many years, the absence of most of the books from which I had derived light prevented references, and perhaps quotations with acknowledgments of debt, which might otherwise have been made. The limited supply at hand of the books I wished to combat, had also the effect of confining my references to the works of leaders and accepted representatives.

What I regretted even more than this was the want of some scientific friend at hand, to whom I might have submitted allusions to physical science. Such allusions, however, being only for the purpose of illustration, and never for that of expounding any points of physical science, any inaccuracies which may have escaped me will not affect the argument.

It is now almost twenty years since my near relation, the late George Morley of Leeds, known there in connection with science, begged me to enlarge certain notes on the topic of the following volume, and to publish them

separately. He subsequently very urgently repeated this suggestion. In the interval that has elapsed since then, as one new variation after another of what is called the Positive Philosophy appeared, I have made many returns to the study of the founder of the school, and his most accepted expositors, aided by the new and often transient lights. If the effect of this long-continued and growing familiarity has been to reduce my estimate of the quality of the reasoning current with founder and disciples to a point which may be thought low, I can only beg those who think that it is too low to suspend their judgment until they have long read the originals, and taken a good many years with a view to test their estimates of them before committing themselves to an expressed opinion.

How far this attempt falls short of the treatment due to a subject so important I deeply feel; yet I do not send it to press without a hope that a vein of thought is here struck, which, followed up by others possessing more strength, more knowledge, and more talent, may yield some useful results.

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PART I.

GENERAL VIEW OF THE QUESTION.

In the present day few things are more familiar to us than writing, in which it is taken for granted that minds and bodies are both governed by laws of one and the same order. This view is not formally expressed as often, perhaps, as we might be entitled to expect, considering the manner in which it is habitually assumed. Nevertheless, attempts to give expression to it are not wanting; but such attempts are not always carried through. More frequently, as it seems to me, than is usual in struggles of thought, gentlemen who make the attempt succeed only in saying something of uncertain sound. But this is not the case with all. Sometimes the writer lets us see clearly that he knows not only whereof he affirms, but also what he says.

I.

Of these successful attempts to express the opinion in question I do not remember a better than one due to a countryman of our own, John Stuart Mill, when interpreting the ideas of a Frenchman, Auguste Comte: "All phenomena, without exception, are governed by invariable laws, with which no volitions, either natural or supernatural, interfere.*

* "Auguste Comte and Positivism," 2d ed., p. 12.

Now a proposition like this is a comfort. In it we have no mystification in the predicate any more than in the subject, no attempt to pass off as human speech terms which as yet are only struggling to make their way into the world—terms which may not survive the throes of birth; we have not even the use of terms which may, indeed, have already acquired a meaning for some one small school, but have not as yet any recognized meaning for the bulk of mankind. Still less is there any attempt to foist upon terms having a recognized meaning another and a widely differing one. Here can be no dispute as to what is spoken about; it is "all phenomena without exception," including phenomena of minds, phenomena of living bodies, and phenomena of bodies without life—phenomena terrestrial and phenomena celestial. What is still more to our purpose, we also know clearly what the writer meant to say respecting all these phenomena; not that he manages to say it in his proper predicate, for of that every word is ambiguous, but that he succeeds in making the true meaning show itself by adding to the predicate an explanatory clause which, being itself clear, makes the rest clear. All that Mr. Mill, in his proper predicate, affirms of phenomena is, that they "are governed by invariable laws," an expression as vague as the language of a boy. But to make it clear, he adds this clause, "with which no volitions, natural or supernatural, interfere." Now, this does make his intention clear. It shows that when Mr. Mill said "invariable laws," he did not mean only what the words mean, namely, unalterable laws, but that he meant what the words do not mean, namely, inviolable laws, or laws both unalterable and inviolable.

Clearly an invariable law means one that cannot be

altered, and an inviolable law means one that cannot be broken. Comte, by his favorite and vague word "invariable," meant laws that cannot be broken, and that is what Mr. Mill intended to convey. Knowing this, we also know what must be meant by the term "govern"—a term which, without this light, would be as ambiguous as the rest. Queen Victoria "governs" Englishmen, but not by laws that cannot be either altered or broken. Temperature, on the other hand, governs the freezing, melting, and vaporization of water, but governs them by laws that cannot be either broken or altered by any human will. Of these two widely differing senses of the word "govern" Mr. Mill well knew which Comte meant, and therefore explained that according to him all phenomena without exception are governed by laws that can never be violated and can never be mended. Even in saying this, however, he fell into saying a good deal more than he intended; for his phrase, that the laws could not be "interfered with," is as wide as wide may be.

II.

Let me not be understood as saying that either Comte or Mill, in the working-hours of mental life, held by any such notion as that the laws which govern phenomena cannot be "interfered with" by human will. It was when building systems that Comte spoke of them as not being interfered with by wills natural or supernatural. But so far was that idea from ruling his own thoughts, that he often speaks of the modification of phenomena by man. And in treating of such modifications, both he and his school frequently lapse into the expression that we modify the laws. But they do not mean any such thing. They know better. All they mean is, at bottom, only what I shall here plainly say, namely, that though we can neither

alter physical laws nor break them, we can at will set them in motion—can set them in motion with different degrees of force, can choose the direction in which we set them in motion, can change that direction, can set one of them in motion in this direction, another in the opposite, a third in a direction that crosses both of these two, and so on through a series of unknown extent.

This power of setting the laws in motion, of changing the direction of their motion, of varying the numbers set in motion, amounts, indeed, to a formidable power of modifying phenomena; but it in no way amounts to a power of modifying laws. It makes the looseness of the expression that laws cannot be interfered with manifest enough, but it does not alter the fact that the talk about modifying laws is another instance of looseness. It is owing to our universal consciousness that the laws themselves cannot be modified that we confidently proceed to set them in motion in order to modify phenomena. To modify a law means no more and no less than to alter it. None of the host of writers who speak of modifying laws believes for a moment that we can alter any one physical law. Indeed, they would be terrified at the thought of our being able at will to do so. The engineer of a steamer, who knows his engine, would smile if you told him to modify the law of the fire, or the water, or the iron, or the copper, of this movement or that, or to modify the law of the temperature or the pressure. But he would equally smile if you told him that he could not "interfere" with the operation of any one of these laws, or of the whole of them. Just because he is confident that the laws of the movement cannot be altered is he able to count with certainty upon modifying that movement itself as he pleases, making it a forward movement or a backward one, a rapid or a

slow one, a steady or a remittent one. Or, to take an illustration from the moral domain instead of from the physical: A court of justice has no power to alter law; but it is its business to interfere with it and with its operation in every way that is not contrary to any law. But when once a person has accepted such a mixture of ideas as to identify the altering of laws with the interfering with them, it is easy for him to accept the next mixture, and identify the modifying of phenomena with the modifying of law.

So far, therefore, from saying that Comte or Mill, or any of the followers of the one or the other, really believe that minds and bodies are both governed by laws of one and the same order, I must confess that with me it is to this hour a case not proven that any man could, in the silence of his own soul, ever say to himself, with intelligent conviction: I do believe that discernment, judgment, and choice, that forethought, after-thought, and conception, that affection, imagination, and conscience are governed by laws of one and the same order as weight and measure, taste and odor, color and form. Fully as is the human intellect capable of rebellion against the lessons of experience, and of contempt for the registered knowledge of the race, I have my own doubts whether it ever goes so far in that direction as to enable a man to sit down on a cliff by the sea-shore, and with all his thoughts alive say to himself: Those children on the beach are to be governed by laws of one and the same order as the pebbles among which they play. I have my doubts whether it ever goes so far as to enable a man to go into a school and say: The scholars are to be governed by laws of one and the same order as the forms and tables; or to go into a factory and say: The workers are to be governed by laws of one and the same

order as the machines; or to stand on a ship's deck and say: The crew are to be governed by laws of one and the same order as the tackling and the spars; or to go into a great laboratory and say: The students are to be governed by laws of one and the same order as the retorts and powders. To me it seems more than doubtful, it seems incredible, that any man looking upon this audience, with perfect recollection, could set himself before the tribunal of his own consciousness, as we all can do even in a crowd, and say, with unfaltering tongue: I do believe that the thoughts and feelings of these men and women—that their assent and dissent, that their attachments and antipathies, their joy and grief, their self-approval and self-condemnation—are governed by laws of one and the same order as are the positions of the boards in the floor and the stones in the wall.

III.

Are there, then, in existence laws of two different orders? Speaking strictly, I should hardly say that there are; for what is called law in physics is not really law in any scientific or philosophical sense, but, whether viewed scientifically or philosophically, is nothing more or less than Rule, and can be called law only in a metaphorical sense. In the realm of morals we find law in the proper sense—in the sense that is clear to the philosopher, that is inevitable to the jurist, that is "understanded of the people," that is wrought into all the act and thought of humanity ever since the first of its steps that have left any print on the sands of time. Now law, in this proper and familiar sense, is found in the realm of morals to be the instrument of preserving order between man and man, and thus to be, in effect, the instrument of preserving society itself.

This being so, the human mind perceives that something

analogous to it exists in the realm of physics, something that preserves order—order between atom and atom, between mass and mass, between a single mass and a whole group of them, between one group of masses and another group, between bodies at rest and bodies in motion, between one group in motion and other groups in motion; order within one homogeneous mass, between molecule and molecule; order between masses differing in their properties, between element and element, between compound and compound, between solids and liquids, between liquids and gases; order between mineral and vegetable, between vegetable and animal; and order still when, upon leaving the realm of bodies without life, we rise into a higher region, a region wherein body still continues to be important, but only in the measure in which the canvas of the painter or the marble of the sculptor is important—namely, as the ground on which mind, in its differing degrees of strength, can display itself and act upon other minds, be they of equal grade or be they of other grades, inferior or superior; for as all body is not the same body, so is not all mind the same mind: as there is one body of the beast, another of the fish, another of the man, so is there one mind to one creature, and another to each diverse kind of sentient being. In this higher land of life we find order between an animal and those of its own kind, order between those of its kind and those of other kinds, order between lower animals and higher ones, order between both of these and man, order between man and the vegetables, between man and the minerals, order within the body between one member and another, between eye and ear, between hand and feet, between lung and nostril, between larynx and lip, between heart and brain. This Order stretches far abroad as readily as it operates

within one microscopic animalcule, exhibiting order between the earth and other worlds—such order that, though this home of ours is always being hurried sightless along a path nowhere traced, and though sightless globes are rushing on the one hand and sightless globes rushing on the other, yet do they all find their way, and so perfectly keep time, that the human mind calls their combined action harmony. Finally, the mind sees that order between us and those distant worlds is upheld, not only in respect of the mechanical movements just referred to, but in the sensitive relations of organic life — such order that our corn sprouts in direct dependence on a world distant from ours by millions and tens of millions of miles; and whether water or wind drives the mill that grinds the corn, the water runs and the wind blows immediately under the influence of that other world which, so far as we know, has within its own bounds no miller waiting to grind and no eater asking for bread. This order between the inanimate sun and inanimate fields evidently is not ordained to terminate with the fields, but is aimed at a point farther on, where order must be kept up, not only between the two worlds, but between both of them and beings of fragile mould, who can exist only by virtue of complex harmonies being sustained between themselves and the earth below them and the sun above them. Yet such order is actually maintained that, frail as is the foot of a babe, it is set down in restful tranquillity upon a globe that is at the time whirling, rushing, and internally on fire; and though the inlet to the human eye is one of the smallest of openings, and the sun is the largest mass in our system of worlds, so good is the adjustment between these two that, through an opening which a pin's head could not enter, come in upon us noble delights, revelations of

all but infinite significance, and almost everything that can be called scientific knowledge. So good is the order that, little competent as seems the inlet of the eye to receive communications from across lapses of blank space so long that a line stretching from here to the sun would fall farther short in an attempt to measure them than would a baby's finger in an attempt to measure an Alp, yet through that inlet are those communications delivered, until, whether in shepherd or astronomer, the eye becomes the meeting-place of many worlds.

IV.

The human mind, then, seeing this complex and beneficent order maintained, feels that, as in the realm of morals order is the preservation of society, so here, in the realm of physics, is order the preservation of all existing life. For while without moral order life might still exist, though society would perish, without physicial order life itself would be an impossibility.

Hence comes it that, just as in the realm of morals the provisions whereby order is preserved bear the name of laws, so, by a very natural process, the language of morals being borrowed, do the provisions by which order of a totally different kind is preserved in the realm of physics receive also the name of laws. This process, natural as it is, results, however, in calling by the self-same name two things that lie very widely apart.

The term physical law would in itself be a perplexing one, even were it freed from any danger of confounding things dissimilar. When we say English law, we mean law made by the English authorities. When we say American law, we mean law made by the American authorities. But when we say physical law, do we mean law made by physical authorities? They who talk most

of our being governed by laws seek to foreclose this natural question by coolly telling us not to inquire into causes; for, say they, causes are inaccessible; therefore, inquire only into laws, but never into law-givers. They add, seriously: Ask How? but never ask Why? Be a slave, but aspire not to be a child; for only slaves will never ask Why? and the How, as babes in thought might know, is often much more "inaccessible" than the Why.

What do they mean by their rhetorical term "inaccessible?" They mean invisible, inaudible, intangible—not to be perceived through sense.* Thus explained, it is true that the causes of physical law are inaccessible, and that wherever cause means originating cause in the highest sense, it is not to be perceived through sense. Yet the search after chains of causes is the most fruitful path trod by the mind of man; and of ascertained causes few, comparatively, are perceived through sense, the great majority lying beyond the limits of sense, though suggested by sense to intuition, and verified again by sense to reason.

But in trying to lop off the highest branches of our intellect, these teachers inform us that there is one branch which may be allowed to grow. They seem to think that

* Comte himself, in his "Discours sur L'Esprit Positif"—a manifesto more mature even than his "Philosophic Positive," and less marked by his mental idiosyncrasy than the later works, his "Politique Positive" and "Synthèse Subjective"—employs the expressions accessible "to the understanding" and to "observation" as if they were equivalents. What he permits he describes as "researches truly accessible to our understanding" (p. 41). What he scouts, and will not even take the pains to deny, are: "Any conceptions whatever of our imagination which are by their nature inaccessible to any observation" (p. 43). Of course he here means especially what he calls theological conceptions—that is, above all, belief in God and immortality.

it, at least, is not in danger of aspiring towards the heavens, but is to be trusted to turn always downwards. We may, they inform us, inquire into laws, though not into causes. And are not laws quite as "inaccessible" as causes? What law of physics is visible, tangible, audible? What law is perceptible through sense? Are they not all suggested to human intellect through sense, as the unknown hinted at by the known? Are they not, then, discerned by intuition, and next tracked out by reason, and finally corroborated by observation? Not, mark well, observation of the laws themselves, which, I repeat, come not within the range of direct perception through sense, but by observation of effects, and phenomena, and relations which are explained by the law, and, being so explained, establish that particular account of them as the discovery of a law.

It is too little to say that causes are not more "inaccessible" than laws. They are less so. In ten thousand cases the causes of phenomena have been well known long before the laws governing them were spelled out; and the knowledge of the cause of any phenomenon is the best stepping-stone to the knowledge of its law. We all know that in certain cases of insensibility, and even of death, the cause is inhaling chloroform. But which of us knows the law by which that substance inhaled in certain quantities takes away consciousness, and in other quantities life? Science is on the track of the law, and will probably find it, having been long in possession of the cause, and using the knowledge of that tentatively for benevolent purposes, in expectation of the time when a clear knowledge of the law would enable it to use it with scientific certainty of proportion and result. It is true that the search into causes has a tendency to lead up to one great First Cause. Is it on that account to be abandoned? If research into forces

tends to lead up to one central force, is it therefore to be cut short?

It is felt that both the question Why, and the answer Because, have two poles, each of them by one of its ends pointing to an intelligent origin, and by its other to an intelligent design. And as we are to give up inquiring into causes, so must we also give up discovering design. This is technically expressed by saying that we are not to seek for causes either original or final. We are, be it remembered, allowed to inquire into laws, always provided we empty law of the ideas most natural to the word, and think of it only as dead rule—a rule discovered, indeed, by mind, but never set by mind. Now this demand to give up the study of causes and designs is simply a demand that we shall truncate our own intellects, and do it at both ends. We, as standing by the stream of time, are to be free to inquire as to reach after reach of its course, as to eddy, shallow, bend, and pool; and also as to fish, bird, craft, or human swimmer that may come upon its waters; but as to that inconvenient tendency of our minds to infer that where there is a river there is also at one end a river-head, and at the other end a river-foot, we must smother that tendency till it dies out. It may be true that there are sages dwelling at Timbuctoo so deeply enveloped in mid-earth that to them it seems impossible to find a goal at either end. Yet will the human mind affirm, Nevertheless the river has a head, however far out of sight, and the river has a foot, however far out of sight.

It is no lawful impediment to the human mind to be told that things are inaccessible. It naturally turns towards the inaccessible. It knows that what is inaccessible to-day becomes accessible to-morrow. It knows, as a matter of fact, that in time past the way in which things

now accessible were brought to light, was in searching into what had always before been inaccessible. In seeking for the East Indies by crossing the Atlantic, Columbus did not find them, but he did find the West Indies. I think it is Lessing who has a fable of a hen, or some other earth-bird, asking an eagle, Why do you build your nest so high up in the air? Because, said the eagle, if I did not so train my brood while young, they might not fly into the face of the sun. The human soul finds itself here with the instinct that its extraction is from on high, and its ultimate sphere high up, among things "inaccessible"—with the instinct that it belongs to the family of the immortals, that it is the offspring, not of dust, but of God, the Infinite One. Now, next to infinity itself, the highest endowment is the possibility of an everlasting progress—progress from known to unknown, from accessible to inaccessible, from possible to impossible, from pure to purer, from happy to happier, from glorious to more exceeding glory. This path of progress towards the unknown and the inaccessible will we—following nature and obeying grace—joyfully pursue, notwithstanding the natty French injunction against either studying causes or asking Why.

If debased coin has been foisted on a nation, it is vain to say that the cause is inaccessible, and that all that must be done is to endeavor to discover the law. Suppose you do discover that the law of the alloy is one portion of a base metal to three of the precious one, and that the law of the coinage is one stroke of the die to a single piece, how much have you discovered? Enough to meet the case? Have you either explained the origin of the phenomenon or satisfied the nature of man which calls out for the cause? All you have done is to point out two

rules of proportion observed in the procedure, and by an easy rhetoric you have put upon those rules the name of laws. But if you think to pass off this as any real explanation, human nature pushes you and your explanation out of its way. It knows that the rule of proportion observed in the alloy was no cause, and that that rule itself had a cause. It knows that the cause of the rule was an intelligent being. It knows that it was the will and the authority of a person which erected the rule of proportion into a law for those who conducted the mint. Human nature will not let go these two facts, that the rule of proportion in itself was no law, and yet that it had been set as law for the managers of the mint. Hence does it demand to know who was the person by whose authority this rule of proportion was made into a law of procedure. To substitute law for cause is puerile thinking, as much so as it would be to substitute method for intention, and indeed is a closely analogous blunder.

V.

Another expression, involved in a similar tangle with the phrase physical law, is the phrase physical research. When we speak of Livingstone's African researches, it is not necessary to explain that what we mean is not any researches into Livingstone conducted by Africa, but researches into Africa conducted by Livingstone. And when we speak of deep-sea research, it is not necessary to explain that we do not mean research into Wyville Thomson conducted by the deep-sea, but research into the deep-sea conducted by Wyville Thomson. But when we speak of physical research, it really has been made necessary to explain that we do not at all mean research into human thought conducted by lifeless bodies, but research

into bodies conducted by human thought. Physical research is research suggested by mind, begun by mind, maintained by mind, guided, lighted, and varied by mind, cheered on by mind, and acclaimed by mind. It is research that cannot proceed except according to the laws and limits of mind. Though called physical research, its natural history proves that it is properly mental research into physics.

Accordingly, every separate physical law, as it is called, represents discoveries made by mind as to the rules of proportion, and methods of procedure found to prevail either in the constitution of physical substances or in their processes — that is, technically, either in their statics or their dynamics. It was by an act of mind that the possible existence of such a law was suggested. It was by a series of acts of mind that its actual existence was ascertained. It was by an act of mind that the expression of the law was formulated. It was by concurring acts of multifarious minds that the expression of the law was accepted, accredited, established as one of the guiding lines of science. It is by a perpetual repetition of concurring acts of mind that its place and authority in science are day by day upheld. Such a law, then, is physical only in this sense, that it is of force in the realm of physics. But when we speak of the laws of any monument of architecture, we do not mean laws that the stone, or lime, or timber brought upon the ground in themselves, and applied for themselves, or laws that, once upon the ground, all of them collectively evolved from their own consciousness. We distinctly mean law conceived by the mind of an architect, determined by his will, and impressed upon stone, lime, and timber by methods directed by his design.

But here come in our modern masters with clouded

brows. We are quite free to recognize the glory of the human mind in discovering physical laws, and free also to recognize the beauty of proportion in the universe—proportion of weight, of measure, of velocity—wherein these laws find their noble and harmonious expression. Though rather grudgingly, we are even allowed to recognize a certain harmony between the mind which suggests and ascertains the existence of these laws, and the external universe wherein they have their embodiment. But if we dare to say that inasmuch as it required an act of mind to discover them, an act of mind to enunciate them, and acts of mind to accept and verify them, so in all reason must it have required an act of mind to conceive them, an act of mind to embody them, whether in stone, or tissue, or solar rays, also an act of mind to erect them into operative laws, and that all these acts must have been ruled by a design; if we say this we are jeered at, and the jeer is called thinking. Nevertheless we do say it; and while saying it, jeer who may, we feel that every fact in recorded experience cheers us with its amen; for of things unknown there is in all the range of human experience nothing more perfectly unknown than the setting of rules of proportion and methods of procedure without a mind to measure magnitudes and to devise plans, or without a purpose to which those plans have tended.

Finding, then, that our minds have in them a clear correspondence with the rules of proportion and methods of procedure embodied in the mighty works above, beneath, around, and within us—works infinitely greater and infinitely more minute than our powers could produce—we go on to say that all reason tells us that the correspondence between mind and those rules and methods cannot stop with our mind. On their upper surface as well as on their

under one they must correspond to mind. The rules of proportion, the methods of procedure, embodied in physical nature and called laws, corresponding, as they do, to our mind, which knows them but in little part, and yet has to mark, learn, and conform to them, must surely correspond also to a mind that knows them all, and knows us, and knows whatsoever remains to us unknown. And by such a mind alone could these rules of proportion and these methods of procedure have been erected into laws governing with iron rule all unconscious agents, while at the same time, in respect of intelligent agents, wondrously serving the double purpose of laying foundations for their dominion over inert nature, and of limiting that dominion by impassable bounds.

These general considerations are sufficient to indicate how rudimentally different are moral law and physical law. Nevertheless, they in common possess one attribute of importance sufficient to account for their being very easily confounded.

PART II.

THE DIFFERENCE BETWEEN THE TWO KINDS OF AGENTS GOVERNED RESPECTIVELY BY THE TWO ORDERS OF LAWS.

The common attribute possessed by both moral law and physical law, which accounts for their being easily confounded, is this: Each of them determines an order of relations between one agent and other agents. Yet to say even this much, terms have to be employed in different senses. In the above proposition at least two important words are so employed, and how great is the difference of meaning may soon be seen.

If I say, for instance, that a moral law determines an order of relations between one agent and other agents, and that a physical law determines an order of relations between one agent and other agents, I seem to have stated a couple of propositions with two subjects, indeed, but with only one and the same predicate. The apparent oneness of the predicates, however, arises only from the ease wherewith the mind accepts language in different senses. In what is said above, I might be taken to mean agents of the same kind, relations of the same kind, and a determining of the same kind. And many who have too much knowledge to mean this, employ language as if they were not unwilling that their disciples should be unaware of any difference.

I.

When I say that a moral law determines an order of relations between one moral agent and others, but that a physical law determines an order of relations between one physical agent and others, it becomes plain that in respect of the agents subject to their sway the two orders of law vastly differ. The difference between them would become still more apparent did I attempt to assert that a moral law determines the order of relations between two physical agents, as, for instance, between water and fire, or between oxygen and nitrogen. All know that you might as well talk grammar to any one of these four agents, as talk morals to them, and might as well attempt to influence them by money as by law. Again, if I attempted to assert that a physical law determines the order of relations between two moral agents, as, for instance, between father and child, or between brother and sister, all would know that in those relations order is not ruled by any law invariable in its operation; and every physical law, just because it is inviolable, is also invariable in its operation.

Taking, then, the relation existing between father and child, we cannot say whether the facts developed under it will be pleasant or painful to the two agents, whether they will be edifying or demoralizing to beholders. They may turn out to be either the one or the other. The same is the case as to the relation of brother and sister. Yet whatever the moral agent may do, he never violates or alters a physical law. A brutal father no more violates physical law with the hand that knocks out the brains of his child, than does a good father with the hand that snatches him out of the fire. A greedy brother acts under physical law as uniformly in the movements that

put him in possession of his sister's goods, as does the good brother in those by which he furnishes his sister with daily bread. Nevertheless, in the case both of the cruel father and the greedy brother, laws are broken. But these are laws that were not written on the unconscious adamant of atoms, but on the conscious ground of mind.

Here, then, we find that a moral agent presents us with this difficulty. We may know of what species he is, and yet not know of what character he is. We may know what are the qualities of his father and brother, and not be quite sure that the same will be his qualities. We may know what his course ought to be, and yet not know what it will be. You know, for example, that this man is a father; but the moral relation, and the moral law that rules that relation, do not guarantee the invariable action of the agent. In spite of all that is involved in the nature of the relation, in spite of all the authority of the law, the question remains an open one, Will the father be cruel or kind—will he destroy his child or cherish it? So with the brother, notwithstanding all that is involved in the relation, notwithstanding the sacredness of the law, the question remains open, Will he help his sister or plunder her? Now these two questions amount to no less than this, Will the one break the law of a father or fulfil it? Will the other break the law of a brother or fulfil it? The putting of such questions proves that you are clean outside of the realm of physical agents, who never give rise to any such questions. But, dealing with moral agents, such questions must needs arise. Here, then, among moral agents, you are no longer in the realm of dead certainty, but in the elastic realm of probabilities.

While, on the one hand, among the probabilities must

not be reckoned any probability that a moral agent will break physical laws, which he can no more do than can inert physical agents; on the other hand, the tremendous faculty possessed by him of power to break law, applies to a law of which he is cognizant, and to which in his inner man he consents that it is good. Yet knowing it to be good, and also knowing it to be law, knowing it further to be unalterable, he nevertheless equally knows that he has power to depart from the good, and to violate the unalterable law of his being. This awful power he actually puts forth; and then is he conscious of having in very deed departed from the good—conscious of standing where physical agent never did stand—that is, under a broken law! Among moral agents we are not only in the realm of probabilities, but also in the realm of conscience.

II.

So much for moral agents, and now to turn to physical agents. They always present to you this facility, that if you once know of what class a physical agent is, you also know of what character it is. If you know the qualities of its kindred, you know its qualities; for never will you have to reproach a particle of hydrogen, which is itself combustible, with the fault of a brother particle that will not burn. If you know what the course of action of any physical agent ought to be under given circumstances, you at the same time know what its course actually will be. The law that determines its properties and its action is a law that changeth not, and also a law that admits not of disobedience.

When once you know that a given substance is nitrogen you never dream of asking, Will it not burn if too much tempted? You know that it will not burn, and cannot

be tempted. No more do you ask, May it not be advised to support combustion under certain circumstances? You know it will never support combustion, and that it cannot be advised.

Again, when once you know that another substance is an alkali, you never caution it not to behave behind your back, like an acid, and never incite it always to act like a true and trusty antacid, whether you are present or absent. Knowing what it is, you know what it will always be. Knowing what it has once done, you know what it will always do. If it is an acid, it will evermore play the part of an acid. If it is an alkali, it will evermore play the part of an alkali. So long as it is left to itself it will be invariably the same. If interfered with by some other agent, its action will always be the same, under the same form of interference. If the form of interference should change, its action will change, but again always in the same way, under the same circumstances. To every new form of interference it will present a new phase of its action, and never change that phase unless when the form of interference changes. Here, then, among physical agents, we have come down from the expansive region of probabilities into the unyielding rock of dead certainties.

III.

One consequence of this invariability in the action of physical agents is that none of them is ever troubled with the question, Shall I do wrong in acting so and so, under the circumstances? Their action is ever according to the pre-established relation of agent to agent, and all new circumstances are by them met according to the pre-established rule of modification. Naturally, therefore, they are never troubled with the questions, Have I done wrong?

Have I failed to play my part? Have I disappointed well-founded expectations? Have I by my fickleness spoiled a useful combination? The physical agent cannot do wrong, cannot fail to play its part, cannot disappoint any well-founded expectations, cannot be fickle, or wayward, or of doubtful mind. Among physical agents we are not only below the realm of probabilities but below the realm of conscience, in a realm where guilt never comes, where neither self-reproach nor blame from others ever blows its withering breath.

Here, then, we have a class of agents that do not know the laws which they fulfil; agents that cannot be tempted and cannot be counselled; agents that, if left to themselves, never change, and that, when not left to themselves, meet any action of other agents invariably in the same way, under the same circumstances; agents that know nothing of the other agents which may act upon them, know not whether they interfere out of their own will, or utterly without a will, whether they have designs or no designs. Now it is of this kind that are all those agents which the chemist makes, and all those which the physicist discovers, every compound in nature or in the arts, and every element in the Cosmos. Among such agents, then, we are not only below the realm of conscience, but below the realm of thought.

Still further, the iron in a boiler, though it has no knowledge of either plates or rivets, no knowledge of engineer, ship-owner, manufacturer, or railway company, though it never heard the hiss of steam, though it takes no part in forming projects of journeys over rivers, under rivers, through mountains, or of voyages round the world, no part in schemes for fabrics of which even now all the members are written in the book of some designer, and are con-

secutively fashioned, albeit as yet there is none of them in existence, though it does not even know that it is itself to be called upon to play a part in making the journeys, the voyages, the fabrics — nevertheless, when called upon so to do, the iron will faithfully play its part. It will be true to its law, and trusty for its employers. Of all their hired servants, no matter how highly paid, not one more perfectly trusty. And will they not pay it well? Why, they will not even thank it. And for what cause? Because it does nothing that it can help doing. It has no choice. Towards the work it has neither ready mind nor reluctance, towards the employers neither good-will nor ill-will. It lies below the limits of the realm of will. And in like manner, as it is needless to add, it lies even below the realm of sense.

Among agents, then, in whom we find an absence of conscience, of thought, of will, of feeling, we are not to look for the portentous attribute of liberty to break law. We have seen that the moral agent, though unable to break physical law, is able to break moral law. But the physical agent is not able to break any law, physical or moral. The liberty of the moral agent, pregnant with results as it is, nevertheless is limited by bounds strictly defined. Liberty for physical agents has no meaning, because no existence. The physical agent fulfils a law to which it cannot consent, and from which it cannot dissent. It furthers processes of which it knows neither the origin nor the intention. In this manner it serves as the inflexibly trustworthy instrument of thought and will—powers moving in a region above it.

IV.

Now, if we suppose that the instrument were not inflexible, but that, like the moral agent, the physical one were liable to take opposite courses under the same circumstances, so that its action could never certainly be foretold, what would be the consequence? The consequence would be that man would stand destitute of any trustworthy instrument of his purposes, and that his dominion over inanimate nature could never be established. Or if, on the other hand, we suppose the moral agent, in addition to the power of breaking moral law, to be possessed of the power of also breaking physical law, what, again, would be the result? The result would be that physical order itself would be disturbed, and that the dwelling-place of man would be liable to be wrecked by human contrivance, like a house burnt or a ship scuttled by its owners. He that said, "Which of you by taking thought can make one hair white or black?" was far from teaching that physical law can be set aside by human caprice. He that told how at the will of man barns could be pulled down, and greater ones set up, was equally far from teaching that physical phenomena could not be interfered with by the will of man.

It is natural to ask in what sense inflexible instruments, without self-guiding discretion, and even without consciousness, can be called agents? They are so called in a sense that is perfectly natural, and very useful so long as men bear in mind that the term is more rhetorical than scientific, which is what only the few will do. An agent, properly so called, is not necessarily the one who plans an action, or who commands it or procures it; he is the one who actually performs the action, whether in so doing he

carries into effect his own will or only that of another. The agent acts not only consciously, but with a purpose; he does the physical act as the means of giving effect to an act of will, whether his own will or that of some one else.* When, therefore, we set bodies without life to fulfil our purposes, to embody in a physical act the act of our wills, it is natural to call such bodies agents. And when in spheres to which our wills do not reach we see such bodies carrying out processes of vast concern, processes to which we could not set them, which, indeed, we imperfectly comprehend, though upon them hangs our existence, it is natural to impersonate some force, to call it nature, and then to call the bodies operating in the process its agents. And having once called an unconscious instrument an agent, it is easy, by a further use of the same rhetoric, to describe it as faithful, trusty, and so forth.

V.

This application of rhetoric ceases to be useful so soon as men, captivated by it, begin to impute to inanimate bodies attributes brought by their own minds to the observation and manipulation of such bodies. This vicious

* Professor Sheldon Amos, in his "Science of Jurisprudence," thus describes principal and agent: "The person who intends and wills, and the person who acts—that is, in the narrowest sense of the word 'acts,' where it means simply 'puts the necessary muscles in motion, so as to produce the desired effect.' In this case the whole moral responsibility is shared between the so-called principal and the agent" (p. 90). But it is obvious that a human agent always intends and wills, as well as the principal. He does not plan the act, or perhaps approve of it, or like it. But he understands the intention and the will of the principal, else he could not be an agent. And he, for himself, intends and wills to carry out his instructions, fulfilling, for his own reasons, the plans of another.

process is easy to enter upon, and when once started grows in velocity till unconscious atoms are first presented with various powers of mind, and then exalted, by one final grant of unlimited possibilities, into a power fit to produce intelligent creatures—ay, fit to replace an intelligent Creator; fit, indeed, not only to fashion our world, and all that is therein, but also fit to hold up in the cold interspaces that balance of intercosmic forces which, perhaps, of all the wonders of the physical universe, is the most eloquently wonderful.

However natural may be the investing of physical agents with mental attributes, and however it may represent a form of human sentiment familiar from the earliest ages, the indulgence it on these accounts obtains is not easily extended to it when the process goes on, as very naturally it does go on, to divest moral agents of moral attributes, to call upon them to put a stop to some of their noblest mental activities, and, in fine, to reduce them to aggregates of atoms ruled by inviolable laws, and incapable of being affected by volition. Make instruments into agents by poetical license if you will, but make not agents into mere instruments by any fiction whatsoever. Forbid physical agents to search after causes, or to trouble themselves about design, and they will not be in any danger of disobeying you. But bid your all-competent physical agents to study laws and generalize facts, and they will be incapable of obeying you. Laws, facts, study, generalization, are riches of your nature, in which theirs has neither part nor lot. They are not of your nature, and can neither rise into the order of being to which it belongs, nor resist its dominion over themselves within the determined limits —limits not set either by it or by them, but found preestablished by both.

I need say no more to illustrate the fact that moral laws and physical laws differ in respect of the kinds of agents, or the subjects, to use another term, which they respectively govern. But I may add one word as to the different ways in which each order of agents is susceptible of the control of laws. A moral law may command angels, may command men, may in some dim reflection of it, and to some small extent, command the lower animals; but a mere physical agent it can never command. Its force is of a sort that never crosses the boundary-line between the realm of the living and that of the lifeless. All the gases, all the earths, all the rocks, all the elements, all the powers of light, heat, electricity, magnetism, and gravitation unite in treating either a command or a prohibition as idle wind; and a promise of reward or punishment as nothing more. Authority is to them an utterly unintelligible power. They are not susceptible to anything but force. A physical law, on the other hand, may govern the core of the great sun, or the rind of an asteroid, or the globules of a comet's tail, or the granite in our own hills. Indeed, it may govern far away from any of these in lone space, midway between our eyes and the farthest visible star. But the thoughts of an intelligent agent it does not govern. It cannot fix his order of inference, of desire, of imagination, of invention, of hope, or fear, or affection. In all its rule it never says, Thou shalt; and the thought of its addressing any subject physical agent in the language of prohibition, and saying, Thou shalt not, is so absurd, that the fancy of a diamond being told not to imitate the complexion of a ruby is one that does not enter into any head. Yet some who have nobly employed physical research in extending the empire of mind over matter so confidently employ metaphysical dogmatizing to set matter over mind, and do it often in

language so innocently grotesque, that the idea of government by command and prohibition is naturally suggested. But just as agents without wills are not capable of influence from command or prohibition, as they own no power but an irresistible force, so agents with wills, on the contrary, are susceptible of authority, of government by command and prohibition, and are often ruled by these when force would not govern them. In yielding to mere force they feel degraded; it is a power made, not for workmen, but for tools. In obeying lawful authority they feel in their order; it is a power worthy to command willing workmen.

If, then, the agents under the two kinds of law so greatly differ, are the relations established by them of one and the same order?

PART III.

THE DIFFERENT KINDS OF RELATIONS ESTABLISHED BY THE TWO ORDERS OF LAWS RESPECTIVELY.

Our question under this head is, whether the relations established under moral laws, and the relations established under physical laws, are of one and the same order. When we find persons between whom a close moral relation exists we naturally call them relations. But when we find two globules or two masses of matter, between which a close physical relation exists, we do not call them relations, but only things correlated.

Among the heavenly bodies, our knowledge of which is capable of rigid demonstration, and yields a power of prediction more precise than is yielded by science in any other field, what is the kind of relations we find existing? First of all, relations of illumination and reflection, by which alone either the being of these bodies or their phenomena are brought within our ken. Do these relations involve any idea of relative rights and duties? No, and nevertheless they do involve the great intellectual problem of how to project the action of a body across yawning gulfs of separation in such wise that the body shall act where it is not. They show, moreover, that this problem has been wondrously solved. We also find relations of magnitude; but do such relations set up on the part of the greater any tendency to contempt? or, on the part of

the less, any tendency to envy? We find relations of number; but do these involve any idea of abundance or want, of adding, dividing, or calculating fractions; any idea of honest reckoning or of dishonest? We find relations of motion; but do they involve any idea of circumspection? We find relations of velocity; but do these involve any idea of emulation? And we find relations of distance; but do these involve any idea of estrangement, or loneliness, or longing?

I.

Here the ruling relation is a relation to space in the various forms of extension, number, distance, and motion. In extension, we find the note taken by the human mind of continuity. In number, we find the note taken by the mind of division or breaches of continuity, forming individuality. In motion, we find the note taken by mind of definite changes made by bodies — changes whereby they cease longer to be at the point in space where they were, and come to be at a point where they were not, continuing this process through a greater or smaller series of points. In distance, we see the note taken by mind of extension, not as measured upon continuous bodies, but as stretching on where bodies cease to be, and as measured from the point where one body terminates to that at which another begins.

But in all these varieties of relation to space the mind never finds a trace of any moral relation. Nevertheless it does find, at every point, great intellectual problems, and their unspeakably beautiful solutions: the problems, among many others, of co-operation across chasms of practically measureless void, of velocities incomprehensibly rapid, yet perfectly smooth, velocities of enormous masses,

proceeding in many intersecting paths, yet all gently combined.

One other thing has mind to note in this sphere, where above all the spheres of its knowledge it finds that certitude for which it lazily craves in all other spheres, and where by help of such certitude it exercises that power of prediction which it is so ambitious to exercise in all things. The point here to be noted is this, that in the science of the heavenly bodies the mind has no help from any of her five senses but one. The maximum of certainty is obtained on the field where we have the minimum of sensation. When Mind makes her excursions beyond our own world, touch, taste, smell, and hearing go not forth in her train. When she rises above the earth, sight alone attempts to keep pace with her flight, and that only as far up as the stars; arrived at the outermost of which, Thought hardly slows her wings to ask, And beyond? then sailing onward, not into boundless nothing, but amid the infinite wisdom that gave to all stars their birth and calls them all by name, she rejoices surrounded by the Almighty power because of which not one of them faileth.

II.

The relations of the heavenly bodies which we have hitherto noted are such as in the language of the positive school are "accessible"—that is, they are perceived through sense, if only through one sense. But do not other relations exist, deeper in than any sense can penetrate, and relations that are just as well known as those that are objects of sight? To what sense is gravitation "accessible"—that dominant relation of every atom to every other atom, a relation existing equally in sun, asteroid, comet, and falling star, operating as steadily at

a distance of a million of miles as at a distance of an inch? Who has heard its voice at any time, or seen its shape?

Is it, therefore, to be treated as unknown? to be treated as a theological fiction? No, it is known, though not perceptible through sense. It is known by being spiritually discerned, using the words not in the scriptural but in the philosophical sense. The human mind affirms it to be known by such demonstration as no sensation can outdo. Its effects point imperiously to such a cause, and the cause when once recognized explains all the effects, which, in turn, being explained by it, verify it as their cause. By this double process is knowledge carried to the consciousness, and consciousness asserts that we know the existence of gravitation as well as we know that of light or heat.

There is yet another set of relations which lie as far beyond the reach of the senses as do those of gravitation, and yet are as firmly believed by us to exist in the heavenly bodies as in terrestrial ones, albeit in our own world their existence can be verified by more senses than one. I mean relations of cohesion, those relations which hold the same place within a single elementary substance, as between atom and atom of its bulk, as is held by gravitation for any kind of bodies in regard to mass and mass. We believe that in the sun, as well as on the earth, the atoms of any one element, by an elective attraction, special to themselves, cleave to one another so as to form themselves into molecules, and even masses of that element. This elective attraction is different from the promiscuous attraction of gravitation, but works in subordination to it, and in perfect harmony with it. Yet, in believing in the existence of this cohesion within the elementary bodies of the planets and stars, we have no sense whatever to guide

us. In that respect, indeed, we are only on the same ground as in the case of gravitation. But in respect of cohesion we have not the superabounding induction and corresponding deduction which, in respect of gravitation, take the place of perception through sense. In the case of cohesion we have really nothing but analogy. Yet from that analogy alone do we draw an inference which, we are told by all experience, and by all our own nature, yields knowledge as trustworthy as any that can be yielded by a sensation. We accept it as sufficing. And if one said that he did not know that cohesion existed among the particles of elementary bodies in the sun and stars, somewhat as it does in the earth, he would only mean that he did not perceive it through sense. He would not mean that he did not believe it. Nor would he mean that his knowledge of the fact was not knowledge to be trusted and acted upon.

The disclosures of the spectrum have now brought certain chemical conditions of the heavenly bodies within range of an indirect and inferential sensation. But the intellectual effect of this is not to render more certain than before our persuasion of the existence of cohesion among those bodies, but to add a new and exceedingly beautiful illustration of its existence. Even more striking still is its effect in illustrating the dominion of mind over matter—a dominion whereby it so commands sand and sea-weed as to turn them into spectacles by which mind can read what metals float in the air of other worlds, and turns light itself into a printing-machine to put on paper the record of what the light reveals.

III.

We have marked, as one rule relating to our knowledge of physical phenomena, that it is just in the case where we have the minimum of sensation that we have the maximum of certitude. What has now been said leads us to mark another rule—namely, that the two properties of bodies which above all others are fundamental and of formative power—that is, gravitation and cohesion—are not perceptible through any one of our senses. The same rule applies to a third property like to these two, in universality and formative power—namely, chemical affinity. Bodies may be luminous or non-luminous, may be in motion or at rest; but every body must have both gravitation and cohesion. We may say, without molecules and masses no extension of bodies; but without cohesion no molecules, and without gravitation no masses, and certainly no systems of masses widely parted from one another yet moving together in harmony.

As I am speaking of rules respecting our knowledge of phenomena, a third may as well be noted. It is this: that our highest and most various earthly knowledge is derived through that one of our senses which depends for its medium solely upon the heavens. Touch, taste, smell, hearing, are of the earth earthy. They all depend for their mediums upon our own world, either its solids, its liquids, or its air. But sight is more than earthly. It depends for its medium on daily supplies from beyond the impassable. It is the cosmic sense; it sets us in the presence of other worlds; it conveys to us hints of how those other worlds are acting upon ours; it puts the organs of our own frame, puts our gentlest sensations, our widest sweeps of thought directly in relation with the heavens.

It brings to us physical proof that, at the point where the terrestrial abode of man ceases, there do the grandest relations of man begin. To the spring-heads, whence flow out the various streams of light that rejoice this sense by day and by night, we cannot climb. Yet their glory and their beauty lead our inquiries upward, that we may know what little is to be known of that which in its fulness know we cannot. And much to be laid to heart is the fact—written large upon the experience of every day and every hour—that our indispensable knowledge of the commonest things, such as the appearance of our own house, the form of our own visage, the difference between deal and oak, between the wheat and the rye, depends on that heaven-sent influence from beyond the impassable named light—the light that God called good in the beginning, and that we shall call good all our days.

IV.

Here, then, we learn that weight, measure, solidity, and softness exist beyond the range of touch; that bodies, which would yield sweets and bitters could we reach them, exist beyond the range of taste; that others, which would yield odors could we reach them, exist beyond the range of smell; that movements, which on earth would cause the sound of a mighty rushing, go on beyond the range of hearing; and that forces of universal activity, and fundamental in the system of worlds, exist beyond even the wide range of sight, playing with prodigious power, though hidden from every sense, but clearly revealed to reason by the effects of their power, and written indelibly upon belief.

But do we learn that such corporeal relations involve any moral tie? that they have any tendency to give rise

to mutual trust or to suspicion, to gratitude or to a sense of wounded merit, to courage or cowardice, to hope or fear, to affection or aversion, to selfishness or self-sacrifice, to a sense of duty, a love of duty, or a disregard of duty? Have such relations any tendency to give rise to a collision of conflicting wills, to praise or blame, to reward or punishment, to anything properly involved in the idea of relative rights and duties?

V.

When leaving distant fields of search, where sight is the only sense that serves as a handmaid of Thought, and come near home to fields where all the other senses are at her service, do we find that the word "relation" means the same things, or things similar, when it is applied in one case to physical relations, and in another case to relations between moral agents? Taking any one elementary body, we find existing within it relations of similarity and cohesion. The particles of heavy platinum, for instance, and those of light hydrogen, are respectively like to their fellow particles and cleave to them, the one in their own close order, the other in their own loose order. As to either of these relations, is there any hint in them of moral significance? Why we should call similarity a relation at all is to be accounted for only by the ease with which language transfers acts of mind to bodies, and properties of bodies to mind. The similarity of two pebbles constitutes no tie between them. To them it forms no relation, close or distant, tender or cold, proportioned or disproportioned. The one could no more recognize the other as a relation than it could make brooches. All the idea of relation here is formed in a mind which sees the likeness. That likeness gives the two pebbles a relation within the mind, and

though outside of it they hold no relations with one another, and are utterly incapable of holding any, within that mind the relation cannot be ignored. It represents the correspondence between the mind and the things external to itself. It is real, and it may be significant. It may mean that this pebble was once connected with rocks of the same family as that other one confessedly came of, which family had its seat close by precious deposits. Hence a search for the possible origin of the second pebble. Hence a discovery of valuable mines. Thus is it evident that the fault of language did not lie in intimating a relation that had no existence anywhere, but in intimating that such relation was maintained as between the two pebbles, instead of intimating, as were speech perfect it would have done, that it was known, felt, and capable of producing any possible effect only in the mind of a man—or in a higher mind. What is here said of relations of similarity applies with equal force to what are called relations of succession. They, again, are properly no relations at all, except within the mind of man—that is, mark well, if they represent nothing whatever but mere succession. They, in such a case, involve no tie between the two correlates.

But if, in respect of what we are accustomed to call relations of similarity, it is true that no relation as between the two objects is maintained, it would not be true if we affirmed the same thing in respect of relations of cohesion. These indicate, more than mere resemblance, an inherent kindred. They indicate on the part of two globules of the same elementary body a predisposition perfectly reciprocal to cleave to one another, to hold real relations. They indicate, that no particle exists for itself, but that its nature points to relation with other particles. They indicate that though each particle thus exists for others as

well as for itself, it does not exist indifferently for all others of any sort, but for others of its own kind in the first degree, and then for others of different kinds in a secondary degree.

Now, here once more we are confronted with intellectual problems—with the problem of unity in multiplicity, the problem of affinity among things without feeling, the problem of selection by things incapable of comparing. These problems being presented to us through a perfect solution, we forget what they would have been had they been set for us to solve. But what moral considerations ever arise out of such relations? Molecules of hydrogen or molecules of platinum will never raise a moral question among themselves. Left to themselves they would not give rise even to what are called relations of succession, for succession implies change; and, left alone, they could not modify either themselves, one another, or anything else. Left alone, their sole relation to time would be that of continuance.

VI.

When we pass from a single elementary body to observe relations as existing between one element and another, we at once come upon evidence that the selection already alluded to, whereby a particle cleaves to its fellow particles in preference to those of other elements, is only the first of a long and ever-unfolding series of predispositions, wherewith all bodies are imbued, pre-established harmonies, not among metaphysical monads, but among physical molecules and masses, and pre-established harmonies, not framed by imagination, but elicited by observation as very plain matter of fact. As within a single elementary body cohesion points outward from one particle towards its fellow

particles, so between two different elements does affinity point outward from the masses of the one element to those of the other. As no particle exists for itself, so also no element exists for itself. Yet its affinity for others is not promiscuously the same for all. As the predisposition of atoms to cleave first to those of their own kind lays the foundation for molecules and homogeneous masses, so does the predisposition of masses of one element to combine with those of another particular element, rather than promiscuously, lay the foundation for compound bodies. Still further, their predisposition in combining with other elements to do so in fixed proportions, and only in those, lays the foundation for certainty in forming compounds, and for their permanent distinctiveness when formed. Now in all this we behold once more intellectual problems, which to us would have been insoluble, presented in and through a perfect solution; but where are any moral ties between one correlated thing and another, where any moral qualities attaching to their action and counteraction?

Passing, then, from elementary bodies to those dominating displays of nature which the ancients called the elements—earth, water, air, and fire (*i. e.* light and heat)—we see them to be closely related to one another, and ever intermingling among themselves. All the earths are pervaded by water, air, and fire (heat). Without these the earths would be we hardly can conjecture what, and it is only by the combined influence of the others that they are fitted for their place in relation to plant and animal. The waters, again, are pervaded in the great sea by air, and fire (heat), and earth (salt); and everywhere by air and heat. Without them the water would be utterly unfit

for its life-giving work—would, indeed, be nothing but a stone so cold that from it we could receive nothing but death. The air, again, is full of water, full of light and heat, and has its quantum of earth in various kinds. What it would be without water we know not; but it would not be fit for us to live in. What it would be without the fire wherewith the sun warms it we know not; but probably it would fall down upon the surface of the globe in stones as deadly as the deadliest ice. All these, diverse one from another, nevertheless constantly stand in closest relations among themselves, and without pause work together in promoting common ends.

Here again we have repeated the wonderful solution of intellectual problems, problems chemical and problems mechanical, solutions in which are disclosed to us capabilities in the elements such as could not have been imagined till they were brought to light in the compounds, capabilities in the compound such as could never have been foreseen from the properties of the components so long as they existed apart. But where are the moral relations? Every spadeful of earth, every cup of water, every breath of air combines within itself both the action of the three great constituents of this world and the action of another world. But does the air ever feel grateful to the water for its services? or, on the other hand, does it ever refuse to lift it up and carry it about, when the rule of movement is that water shall go upwards and be carried by air? Then, does the air, with all its inconstancy towards plants and animals, ever incur the charge of unfaithfulness to an obligation? Does the water, on its part, contract any obligation to the sunbeams for warming it, or for lifting it above the air? Does it complain when they leave it to be hurled headlong from the firmament into the abyss, and

chilled till it turns to stone? Not a vestige of all this, or of aught akin to it. Among agents without wills we expect to find only relations without variability, without obligation, without possible praise or blame.

VII.

Does this state of things alter when we leave inorganic agents and ascend into the organic world? In this new region we are afresh brought face to face with solutions of intellectual problems which, in the forms wherein they disclose themselves, are replete with charms; but when from the solution presented we travel back to the problems as they would have appeared to us had they been set for us to solve, then, indeed, are we astounded both at their complexity and their number. What a number of solved problems are represented by a single seed, which, in the inaccessible chambers of its minute organization, hides away from our search the records of how were set and how were solved all the problems which had to be solved in order to adapt it to its future destination! To prepare it to be the power that it is to be, adjustments had to be completed between it and things in the earth, in the air, in the water, and in the distant worlds whence come light and heat. It has to live with and by the earths. It contains, ready and adjusted, an apparatus for decomposing earths, and turning their components into its future substance. It has to depend on water. It contains, ready and adjusted, an apparatus for decomposing water, and nourishing its own material with the new liquid. Along-side of this partly retrospective apparatus exists a purely prospective one, ready and adjusted, for pumping the new liquid elaborated by the last apparatus, for making it run uphill, and for spreading it far out on

this side and on that. The seed has to depend on air. It contains, ready and adjusted, an apparatus for decomposing air, and for incorporating its component parts in various forms with its own tissues.

But its manifold relations of dependency do not cease at the bounds of our own world. It has to depend on another world. The founder of the Positive school of philosophy let us know that he clearly saw how he could improve the system of the solar and stellar universe, or thought he saw it, in the shimmer of his own moonlight. It would have been more to the purpose had he shown us that he could improve the fabric of one tiny seed. It would have gone some way to help us to conceive of things that do not presuppose any mind that existed before them, or any plan embodied in them, or any design to be accomplished by them; a sort of things which the sound human mind never did conceive of, and which all human experience declares to be things as utterly unknown, as purely to be taken on testimony, as Comte's power of mending the solar system. Had he shown that he could improve one grain of flaxseed, it would have helped us to endure to be told by grown-up men that all we know of a seed is what is perceptible through sense. Not one of all the various apparatuses just named is perceptible through sense; and to tell me that I do not know that an acorn has the power of converting earth, air, water, and sunshine into oak, as well as I know that it is shaped like an egg in an egg-cup, that it is green, that it weighs on the average so many grains, and that it contains such and such proportions of this principle and of that! These points are necessary to be known, and are of value; but the knowledge of them is that of the carrier who knows the bulk and weight of the drugs he delivers, not that of the

chemist who knows what they can do. We know respecting the acorn the unseen, unexplained powers which reach far back for their origin, back behind our utmost research, and reach far forward for their applications and purposes —forward throughout all generations of time. These do we know just as surely, just as soundly as we know the grosser qualities which show themselves in form, color, weight, and chemical properties. What is more, millions of men, who could not tell an acorn from a chestnut, know perfectly, know with a knowledge fit to be acted upon, that an acorn will grow oak, and that chestnut will not. It is its invisible power, its oak-forming prerogative, that constitutes the one thing about it best known.

VIII.

To return, however, from this point as to what may be known, to our seed, which I said had to depend on another world. Did it possess that kind of mental quality which serves some philosophizers for reason, it might argue that it could not be possible that its future life and welfare, that the growth of its tissues, the development of its organs, the fulfilment of its functions, must depend on another world to it totally inaccessible. The fact is they all do so depend, and there is an end of the question. For if that other world is inaccessible to the seed, it does not follow that the seed is inaccessible to the other world. Other worlds have long arms. Across open spaces, towards bridging over which all the trunks grown in the forests of terrestrial ages would not go as far as would a boy's boat towards bridging over the Atlantic—across these can that other world jet forth its emanations till they reach the seed, till they enter into it, till they pass and pass again through its core, till they diffuse over every

one of its cells a force from on high, which, in ways we know not, turns its array of possible energies into actual powers, bringing forth noble products.

Yet what sense detects in the cells of a seed the apparatus for decomposing air; that for decomposing water; that for decomposing sunbeams; that for turning the heat ray to one use, the color ray to another, the actinic to a third; that for compounding protoplasm; that for converting one aliment into fibre, another into complexion, another into odor, another into pumping force? What sense detects within the seed of the maple the special apparatus pre-established to dot with its pretty bird's eyes generation after generation of its offspring? To tell us we do not know that these exist! it is just what we do know. Apparatus may not be the right name for them. But the invisible power is there, and we know it. These various powers stand to one another in relations pre-established, and they, in turn, predetermine long beforehand the relations of things which as yet are not in existence. But though they fill with wonder the minds of men who are content to let mind work without lacing it up against free movement in search of cause or design—with wonder at the skill, the design, the adaptation, the power of which they are full—they do not, any more than relations among inorganic bodies, present to us any moral ties, or virtues, or defects.

IX.

I have already permitted to myself the supposition of a seed endowed with that mental quality which in some quarters passes for reason. If we follow out this supposition a little farther we may find a seed in a different mood, not the mood of asserting independence of anything above one's own grasp, but in the mood of asserting

independence of any mind, any thought, any purpose, and sole dependence on what is called law. In this mood the seed might say, As to vital relationship existing between the great sun and me it is out of the question. The sun has to hold all the planets together, has to lend Venus and Jupiter their splendor, and to give Mars and Uranus their quota of light and heat. He has to illuminate the whole earth, and to shine in the council-chambers of kings. Is it not absurd to think that he has nothing to do but come down to this lowly bed of mine, and visit me? I do not deny, indeed, that at the origin of plant existence — if origin there ever was—he possibly did give forth some solar impulse to the primordial seed. After that, however, he must have left the seed to be governed by its laws. Therefore, while he is enjoying his greatness in other ways, it is not for me and the like of me to look for any interference on his part, on behalf of us in our struggles against the many dangers thrown in our path by earth, air, and water. Vital relations between me and him are, I repeat, out of the question.

Let the seed reason in this way as long as it pleases, the fact remains that vital relations between it and the great incomprehensible sun do exist. The fact remains that, in spite of all *à priori* improbabilities, the sun does interfere to keep the seed from dying. And a fact equally plain is that one part of the nature of the seed consists in nothing else than a capacity for receiving the emanations of the sun, and for living, growing, and having its being in his help. As, then, the seed, beginning to fulfil its prearranged purposes, and just rising from under the clay, holds up its infant bracts towards the celestial light, it would be easier for the human understanding to say that the plant must feel some consciousness of the great

law of nature, Ask and receive, than it would be for it to say, There is no such law in nature as that of asking and receiving.

Yet, though the obvious relations existing between the seed and the sun might half allure us into imagining that the seed was a conscious agent, we seek in vain for any trace of reciprocal moral ties between the two things correlated, or for relative duties and rights. The idea of possible merit or possible offence arising between them is not only out of the pale of science, but of imagination. Between them relations develop and effects flow on in the cast-iron conduits of physical law.

The same state of things continues to appear if we follow the seed onward into its further relations with its own species, with other plants, and with various animals. Never out of such relations does anything arise that involves an idea of trust or responsibility, of good intention or ill intention — an idea of justice or injustice, an idea of the wilfully destroying or deliberately founding of another's happiness — an idea of conscientiousness in discharging relative obligations, or of want of principle in respect of them.

X.

Whether we take the heavenly bodies, of which our knowledge is on the large scale, and touches but few points, or small seeds, insects, or animal tissues, of which our knowledge is minute, and deals with complexities never ending, still beginning, we find that in the sun-sized dimensions of the one, or the microscopic dimensions of the other, there is proportion—proportion in their relations to space, proportion in the relations of mass to mass, proportion in the relations of the various members of any organized body to one another, proportion in their

motions if merely mechanical, proportion in their organs of motion if animals, proportion even in the pace of those swiftest messengers of the bounty of God, the sunbeams, proportion in the throbs of electricity and magnetism, and in the quasi living throbs of song. Weighed, measured, timed, and again weighed, measured, timed, is written upon all physical things that lie within our knowledge. Now this proportion is one of the things which in our imperfect speech we most frequently call a relation. For instance, among the heavenly bodies we find one line a hundred times longer than another, and we call that proportion of a hundred to one a relation. We find one surface fifty times greater than another, and we call that proportion of fifty to one a relation. We find one figure round, another nearly round, another oval, and we call that proportionate variation of shape a relation. We find one motion increasing in rapidity as the moving body nears another body, and decreasing in rapidity in proportion as it moves farther away from it, and this proportion between distance and velocity we call a relation.

But do the two proportioned lines know anything of their alleged relationship? or the two surfaces, or the two figures? The fact is, that neither the long line nor the short one has an idea either of greater or less, of proportion, relation, or comparison. And as between mere lines, surfaces, and figures, the relation is nothing whatever that involves any action or reaction of the one upon the other. The relation is noted simply in the human mind. It compares and says, less and greater; it measures and says, less and greater in such a proportion; and that proportion it calls the relation. Such a relation, like that of mere similarity, or of mere succession (as contradistinguished from succession by determined sequence), is real; but involving,

as it does, no reciprocal action of the things related, is felt solely in the human mind, and offers another illustration of the correspondence of that mind with the universe it is called to contemplate.

In the case of two bodies the relation is different. They do reciprocally act upon one another. But whether it is the relative length of two lines, the relative size of two surfaces, or the relative distances and velocities of two bodies, none of these relations involve a thought, a feeling, or a duty, not even a consciousness of the existence of any common character, or any tie between the two; and this is what we call by the same name as the living tie that binds together parent and child!

But if into these relations there enters no element of moral life, there does enter that other element at which I have already glanced more than once, the intellectual element involved in the solution of great problems. It is not lines, surfaces, or figures that know anything of proportion — nor yet weights, measures, or velocities. No heavenly body enumerates days or years, or precalculates conjunctions or oppositions. None of all these ever instituted a comparison, ever arrived at a judgment, ever said equal or unequal, ever said too much, too little, or just right — ever said faster, slower, or full speed. Mind is capable of discerning proportion, of estimating its relation, of enumerating it, and of making it into an important guide for its own action. But a relation that has to depend for its being known and felt upon something outside of the two things related is, by its nature, marked off by a broad band of demarcation from that common tie between two moral agents which we call by the same name.

There is a relation between the fore-legs of a chair and the back-legs; but it is not felt by either the one or the

other. It is, however, felt by the human mind. It owed its origin to the fact that the human mind foresaw in the creation of such a relation a possible convenience for the human body. A desire for a comfortable seat led to a conception of how one might be made, and from this conception flowed a design for certain combinations of legs, and so forth—which design led to acts of construction, which acts resulted in fore-legs, hind-legs, and all the rest coming first into separate existence, and, finally, in their all being arranged into their present relative places. Here I assume that the origin of the relation was as certainly mental as the embodiment of it is physical. But suppose that the relation had had a chance origin, or no origin at all, the fact remains that the relation is unfelt and unknown to the members correlated. And that fact is not altered by calling them by names which imply feeling, such as legs and arms. But relations in the higher sense are not unfelt and unknown to the persons correlated. The relation between the mother who sits on the chair and the babe in her arms is not known and felt, solely outside of their own persons, by some being of a nature foreign to their own.

XI.

When we rise into the animal kingdom we at once see the nature of relations manifestly change. The young brood in the nest crying for food, and the parent bird flying homeward with it, are not related merely because the mind of man discerns in them some unconscious proportion or common function. Both the parties related are conscious of some relation; and that relation bears upon happiness and involves affections. So all the way upward, along the extended line of the animal species, we find consciousness and sensibility involved in relations.

Even the relation between the different members of the body is such that the animal is conscious of it. It knows that it can use the tail to wipe the face. The relations of parentage and descent are felt, the offspring looking to the parent, and the parent providing for the offspring. The relations with creatures of their own species is felt and openly acknowledged by socially consorting. Some animals voluntarily form relations with those of a species different from their own.

Many animals consciously look up to a being of a superior order—Man; and it is the nobler of them which are the most capable of showing the feelings proper to such a relation. They can and do offer to him fear, confidence, attachment, gratitude, and obedience, with much faithful service. Some of them are capable of imitating his speech within narrow limits. Some can take from him lessons which form habits of action. If the idea that among plants the law of asking and receiving may be felt is no more than poetry, among animals that law is one of the most prevalent realities. In the bird's-nest, in the lair of wild beasts, in the flocks that know not man, and in those of the sheepfold, among wild horses, and in the cavalry stud, among untamed animals in respect of one another, among tame ones, both in respect of one another and in respect of man, asking in order to receive is a recognized method of nature, springing out of relations as they exist.

This feature in the relations of animals, if it stood alone, would mark a separation from the domain of lifeless relations, and an entrance upon a higher sphere of government, one in which a reign of law proper begins to appear amid and above the reign of sheer rule. In this realm of consciousness, of feelings, of preferences and antipathies, of asking and receiving, of seeking and finding, we have left

behind the region of certain predictions. Here we are in a region where the warp of certainties is all along its course interwoven with a weft of contingencies which often hide it from sight, but never displace it. Even where there is no intervention of an animal's will in the course of phenomena, that course is not always certain. In the spectrum we can always tell in what order the colors will range themselves, and in certain species of birds and beasts we generally can; but we cannot tell in what order the colors will range themselves in the calves of next spring, or in the successive children of one and the same family. We can tell in what direction a certain comet will be moving when next visible, but we cannot tell in what direction the next swallow will fly. We can foretell the day of the next spring-tide, but not the day when the bees will swarm.

Does science promise ever to enable us to foretell the day when the bees will swarm, or the exact order in which fair-complexioned children will exchange with dark ones? If it does not, some write as if it ought to do so. There is no piece of knowledge that science is more apt to teach than that we do not know. And there is no kind of illumination that does more to clear up a position than does this one. Now, as one office of science is to teach us that which for the present we do not know, is it not supposable that another of its offices may be to teach us that there are things of which we are not to foreknow the future? May there not be things whose relation to us is never to be that of rigid instruments capable only of action such as can be infallibly calculated upon, but that of helpful co-workers, enabling us, indeed, to foresee their course with good probability, but at the same time ever keeping us under the discipline implied in being obliged to compare

one possible with another possible, to form a judgment as to which of the two is the more probable, and to choose our course under a sense of certain consequences depending upon the choice? May not the lesson of science to the last be the same as has been taught by experience in all past time—namely, that the path which humanity has to tread, while firm underfoot, and while having a clear direction, is, nevertheless, a path in which it is not always possible to tell what you are to meet with next?

XII.

Still, confining ourselves for the present within the animal kingdom, we see side by side, with inflexible physical rule, groups of laws in operation whereof the effects are, indeed, calculable within certain limits, but are variable beyond those limits. We also see other groups whereof the effects depend on the self-determining action of the animal. For instance, when the frame of the elephant does move, it will do so according to fixed laws of mechanics. When it grows, the trunk will grow in proportion to the rest of the body, yet this proportion will not be exactly identical in every number of the same variety. Now, in the first case, we have laws of invariable phenomena. In the second, laws where phenomena begin to be variable under the influence of vital force. But a third group remains. When will the elephant move? In what direction will it move? How fast will it move? How long will it keep in motion? The answer may depend partly on the individual character of the elephant, partly on its master, partly on an insect, partly on the weather, partly on the steepness or evenness, on the firmness or softness of the road. This collection of contingencies represents two separate sources of possible variability: first, the self-deter-

mining action of the mover—namely, the elephant—that of his master, and that of other animals; and, secondly, the crossing of the mere physical laws of motion by other physical laws of resistance. These render prediction as to any one of the points raised in the above questions rather a moral calculation than a physical one, if words so absurd as "a physical calculation" must be written. How greatly the individual character of the animal influences the possible answer to any one of the above questions is obvious. A voice at which one elephant will set his limbs in motion has no effect upon another. A signal at which one will turn to the left leaves another holding right on. A sight and word that will make one kneel down will leave another standing.

In the relations of all animals the operation of inviolable physical law is kept within a limited circle, and only serves as the base for government in a higher circle, within which a certain play is given to self-determining agency, and a door open for degrees of variety in action. Social laws, inaccessible to any physical test, are stamped on animals of every species, and made manifest by action. Among all varieties of animals, in the social relations formed under these laws, is shadowed forth a penumbra of moral law—hints being traceable of the high and sacred relations which are to be instituted farther up in the scale. These hints men were taught to take note of, were taught to take lessons from in one old, old Book, before ever they allowed philosophers to make them see in animals the souls of their departed fathers and mothers, and very long ages before they allowed Descartes to philosophize animals into mere machines, as in the present day many are ready to philosophize men into mere machines if men will let them. According to the Bible, God's gracious covenant of preser-

vation was made not only with man, but also with the animals. Job took note of wisdom hidden in the mechanism of birds, such as man had never yet displayed. David adored the providential vigilance which measured and supplied the wants of animals, wild and tame. Solomon sent men for good lessons to the school of puny insects. And a greater than Solomon sent us all to the most commonplace of birds for teaching, the fruit whereof is better than gold.

In illustration of the way in which hints of moral government are contained in the habits of animals, we may mention the relations of parent pairs to one another and to their offspring, and those of the offspring to the parents, as dimly shadowing forth the family. The habits of personal defence among animals indicate some sort of consciousness of personal identity and personal rights. Their defence of nest, lair, hive, dam-huts or other house, with their defence of their own gathered goods, indicates some sort of sense of property. Their manner of associating in bodies, which sometimes deserves the name of social organization, and sometimes suggests the fundamental ideas of a state, carries us a considerable way towards the notion of government by law proper. Their entering into relation with races different from their own, and sharing in common with them in vicissitudes and delights, indicates a system wherein manifold natures are born to blend in one whole, while yet, as parts, retaining their distinctness.

Among the culminating points of the relations of animals, their dependence on a higher being—a being before whom, no matter where he sets up his seat, their condition becomes profoundly modified — brings out the fact that a being with a destiny not affected by any higher being is

a being unknown in nature—at least till you come up to man.

Moreover, that capacity of theirs, which has been already mentioned, for knowing, trusting, loving, and obeying a being higher than themselves; for cleaving to one not of their own form, or voice, or ways; for co-operating with one who is ever doing things for which they cannot account, and often employing them upon messages or works to them incomprehensible; their capacity for learning of this higher being lessons which those of their own species cannot teach, and under his training taking on habits that were unknown to their progenitors; their capacity for conforming themselves to the will and ends of one who, without giving to them any account of his ways, can gratify or plague them, reward or punish them, and at will destroy them, brings out the fact that, so far as concerns this world and its inhabitants, they and it are not without a head. This fact, again, suggests the question, Does the institution of headship extend no farther than this little earth? Has the universe beyond it no common Head? Does the ascending order of intelligent being set its loftiest crown on the brow of man?

XIII.

It is true, indeed, that, for our eye, beings possessing form and color have no higher representative than man, and the eye is not made to see any object but such things as do possess form and color. Perhaps some might think it safe reasoning to conclude that all physical agents must have form and color because so many have. The grosser all have: all inert weights. But gravitation is an agent stronger than clay or stone, yet it is invisible. Heat is an agent stronger than wood or iron, and yet is generally

invisible. Coupled with this attribute of invisibility, it displays another which *à priori* would seem an opposite one, but which, studied by experience, really proves to be a corresponding one. It can and does, under given conditions, make itself visible. Another method in which it eludes sense is worth remembering. In ordinary circumstances, if invisible, it is not beyond the reach of another sense, that of touch or feeling. But here again, just as in combustion, it bursts out upon the eye; so does it, by contrast, when vaporizing a liquid, dive out of the reach of feeling, to hide itself as what is called latent heat, where eye and hand both search for it equally in vain. Its near relation, electricity, has the same double character, generally speaking, imperceptible through sense; but, under given circumstances, flashing or crashing into evidence. And its close relation, magnetism, mightily as it affects the living relations and social conditions of this globe of ours, is an agent whose form and color neither Columbus nor Cook ever saw. Yet magnetism is not to be relegated to the limbo of theological fictions, because it is an invisible power whose prerogatives are to be learned not from its own appearance, but from things which do appear in consequence of its action. Nor yet is even gravitation so to be relegated, though more occult still—utterly occult, except as its invisible power is traced in its visible effects.

Even as to solid bodies, would it be sound reasoning to conclude that none can be real which are inaccessible to touch, taste, smell, or hearing? It might be plausible to say, It is impossible to be convinced of the solidity of any body of which you cannot prove by experiment that it is hard or soft, sapid or insipid, fragrant, inodorous, or fetid, sonorous or silent. Now, as to what are spoken of as heavenly bodies, the objector might go on to say, all the

evidence of sense would rather seem to prove that they are spirits than bodies. To handle, taste, smell, or hear them is impossible. And as to seeing them, what is called seeing the body of the sun or of the moon amounts to about that state of things in which, speaking of any familiar object, we say that we really do not see it, only something like a shadow. We cannot know, he might add, that real bodies exist beyond the point where tangible bodies end, beyond the point where all the senses can verify inferences founded on supposed evidences of one single sense. What we really see is only a certain variable dazzling effluence, called light—an effluence coming, as we have said, from beyond the impassable—and this seems more to accord with the idea of spirits than with that of solid bodies.

Plausible as such objections might seem to men whose knowledge and reason were undeveloped, they make no impression on those who are trained in science. For these know that beyond the direct reach of all the senses —that, indeed, beyond reach, whether direct or indirect, of four out of five of them, intimated only to the fifth, and to it intimated in ways so indirect that the eyes of most races and most generations of men have failed to discover them—lie enormous masses of weight and bulk, so enormous that all this earth added to the body of one of them would make no more difference than one tile thrown on the roof of a large building. If, then, solid bodies do not come to an end where the ordinary physical evidences of solidity cease; if our relations with solidity and force pass on beyond the bounds of earth, and cross the open gulfs of the untenanted, unnavigated ether ocean, where hard and soft, sweet and bitter, sounding and silent, living and lifeless, are all unknown; if our relations with

bodies—relations on which depend not only all our physical comfort but physical existence itself—find their centre beyond those gulfs impassable to us and to all men, is it safe, is it in any colorable sense scientific, to conclude that all relations between intelligence and intelligence forever end at the point where man bids farewell to his fellow-men?

Seeing thus that the relations on which depend our light and dark, our warm and cold, our good harvests and our bad ones, are relations of this world with other worlds, is it reasonable, is it practical, is it in harmony with safe modes of framing hypotheses, to conclude that in the deeper comforts of the spirit, in the wider wants of mental hunger, of moral aspiration, of hope, of faith, there are no relations between us and sources of influence higher than the crust of the earth? When humanity stands in doubt about its daily bread, we see the most clodward thinker that ever bent his looks down, down, always downward; a thinker whose stubborn tendency is to scent only the ground, and never sniff the air; a thinker who will always read backward, assuming that every series of events proceeds from below upward, never from above downward; that the order never is from the farmer down to the crop, but from the crop upward to the plough, and no higher than the plough—we see even this infra-human thinker, to whom it is hard to turn the eye upward, compelled by that doubt about bread to do it, to look for once above him, to consent to learn from heaven, to consent to admit of some events which proceed from above downward, for, after all, it is manifest that whether plenty or dearth shall rule here below depends on what the heaven is about to do. He that would, if he could, crib and confine all human thought within the human sphere, is forced by a question of bread to confess that the wheels which grind

for the children of men their corn are all turning in silence outside of the human sphere, not moved by water-power, or wind, or steam, by children's cries or dealers' hopes, but, nevertheless, in their distances inaccessible, rolling round in manifest relation with the daily renewed hunger of this needy family of ours. After this, is it sound, on his part, to conclude that the nobler wants of man — wants the very cry of which itself proclaims him a kinsman of beings above himself—have no sources of supply higher than the earth, and higher than the clouds?

It is manifest that terrestrial relations, whether physical or moral, go on ascending till they reach their apex in man. This point reached, are man's bodily relations brought to a stay either at the bounds of his own person or at those of his globe? On the contrary, his bodily relations, on gaining that critical point, continue their ascending movement, and pass the bounds. They go on whither he cannot follow them. They pass over space, over time, over darkness, over distances incomprehensible, stretching away into the heaven and heavens of heavens.

This makes us ask, What art thou who biddest us believe that the spiritual relations of man, his relations with thought, feeling, and moral action, his relations with intelligent beings, halt short here at the line between earth and sky, and lag behind the relations of his body, in such a manner that while his eye, and, indeed, every pore in his frame, are continually holding joyful relations with the king of the sky, the forces of his soul, which ever tend to climb the sky, have no such out-field, but, like those of an eagle which the enemy has winged, droop backward, downward, towards things below him, till over the sunbright thoughts of man themselves the last word to be uttered must be "clay to clay?"

So much for man, but now a step farther. As all terrestrial relations ascend upward to an apex in man, we ask, is it at all probable that the relations of the whole universe do not ascend upward to one all-comprehending Chief and Head? And as any being whose destiny is not affected by a higher being is unknown to nature till we arrive at man, is it in any degree probable that he presents us with an example of a being whom no higher being can affect? Does not all nature seem rather to say that man is a creature in whose case the relations of his soul must pass onward in the same direction as do those of his eye, the cosmic sense; onward, beyond the bounds of earth, moving upward, forward, towards brighter worlds, towards countless lights, towards a career in which every step is both a goal and a starting-point, towards conscious fellowship with a Higher Power, an Everlasting Father, in whose house are many mansions—a house roomy enough to be the home of a soul whose thoughts outfly sunlight, and sail round and round the most distant globes, and not of it only, but also of kindred souls as many as the stars in the sky for multitude, and the sand by the sea-shore innumerable?

[*Though I hope that what follows to the end of Part III. is not very abstruse or technical, it can be skipped if the reader wishes.*]

XIV.

General as has been this survey of those objects of thought which we call by the common name of Relation, it will suffice to indicate how many are the varieties of things classed under that one term, and how broad are the distinctions between them. In spite of this, the classifying of them under a common head is natural; for the fact

that mice and men are very different kinds of things is no valid objection against classifying both of them as animals. To present to ourselves some definite view of the degrees of difference between various orders of relation, we have only to set down in terms a few of them which are clearly distinct, and yet are all clearly relations. They are here grouped on the principle of looking upon relations themselves as the objects to be considered—and in each case asking what tie between the things related is established by the relation, and what effects does this tie produce upon them. That is, to speak technically, they are classified on the objective method. This, it is needless to say, widely differs from classifying relations on a principle which assumes that, so long as the mind sees a relation between two things, that relation is all the same in a case where no tie is established by it between the things correlated, nor any effect produced by them upon one another, as in a case where a real tie is established and effects follow. This principle of classifying is technically called the subjective. Little as many disciples of Positivism are awake to it, this subjective method is with them an ordinary one.

We note, then, the following orders of Relations:

1. Relation without consciousness on the part of either of the things correlated, and also without any action of either on the other.

2. Relation without any consciousness, but with action at least on one side.

3. Relation without consciousness on either side, but with reciprocal action and reaction.

4. Relation with consciousness and action, but both on one side only.

5. Relation with consciousness on one side, and also

with action on one side; the consciousness, however, and the action, being on different sides.

6. Relation with consciousness only on one side, but with reciprocal action.

7. Relation with consciousness on both sides, and also reciprocal action.

8. Relation with a mutual sense of moral obligation as between the parties correlated, in addition to consciousness and reciprocal action.

9. Relation with not only reciprocal action and mutual consciousness of moral obligation to one another, but also with a consciousness of a common obligation to a common external authority, and to a Higher Power.

Thus it appears that relation may exist in a degree so low as not to involve any action of either of the things related upon the other, or even any consciousness that a relation is believed to exist between them; and, on the other hand, it may exist in a degree so high as to involve not merely consciousness of the relation on both sides, but also conscious reciprocal action, conscious interdependence, conscious moral obligation to one another, and conscious accountability to an external authority, and even to a Higher Power. The first case is that of a long line and a short one, miles apart. The second case is that of a mother and child. The so-called relation of the two lines can never cause to either of them a thought, a wish, or a fear. It cannot, in the conditions supposed, imply even the common tie involved in forming two sides of an angle. The relation of mother and child, on the contrary, is to each of the pair related a prolific source of thoughts, feelings, and acts, intensely affecting the consciousness of both, involving the happiness of both, and bringing with it to both a sense of mutual dependence, and also a sense of

moral obligation to one another, to the family, and to society at large; all of which is overshadowed and ennobled by a sense of still higher obligation to a Father, the common parent of both mother and child.

Notwithstanding the greatness of this diversity, the relation in the low degree is truly a relation as well as that in the high one, but it is of a different kind. In both cases the things declared to be related present themselves to the mind in such a manner that, by its own nature, it is compelled to think of them together, to compare them, and to form some judgment, not of the first alone, nor of the second alone, but of both relatively one to the other. Thus a line is compared with space, and found to traverse a hundred thousand miles of it. Another is compared with it, and found to traverse a million of miles. Then are the two compared with one another, and the first is declared to be the shorter. Not that it is a short line, but that, relatively to the second, it is shorter. Now this necessity of our mind to view two things in comparison with one another is just as strong when we are considering a long line and a short one, or a good metaphor and an incongruous one, as when we are considering a good mother and a bad one, or a demon and an angel. But none the less does it leave an abyss between unconscious relations attributed by mind to things incapable of knowing themselves as relatives, and conscious relations felt reciprocally by kindred beings, and for them pregnant with happiness or misery.

It is manifest that under the head of relations, without either consciousness or interaction, naturally range themselves all mere relations to space and to time. Here we must take care not to confound these relations to space or to time with relations "in space" or "in time." The lat-

ter class are compound, being relations of some two things, firstly to one another, and, secondly, of both to space or time. This mode of classification is so wide that it includes among relations in space no less than all the physical relations of finite things. And in a similar manner relations in time include all relations of things which had a beginning. The expression, relations of space, may mean either relations to space or in it; so also with the expression relations of time. And the confusion often noticeable in discussing relations "of space" and "of time," springs from inattention to this underlying difference. Every question of positive dimension touches a mere relation to space. If a line is an inch long, it stands to space in the relation of traversing one inch of it. That is all. Relations of number are just the same. If a thing is one, it stands to space in the relation of unbroken continuity, or of one beginning and one end. If it is two, it stands to space in the relation of one separation involving two beginnings and two ends.

I think it is Mr. Mill who treats relation of number as relation of succession, because, as he says, one number succeeds another. One act of the mind in numbering succeeds another. One act of the hand in noting by symbols such acts of the mind succeeds another. These acts of the numbering mind and of the expressing hand are relations of succession; but the relations of number in themselves are simultaneous, and are relations to space, and are not affected by time. Just as number is not the numbering mind, so also it is not the thing to be numbered. And just as it is not the series of acts of the numbering mind, so also is it not the series of symbols indicating those acts. Number is the product of the act of numbering, just as web is the product of the act of weaving. The

relation expressed by a tenth is a simultaneous one; that expressed by ten times as much is also simultaneous. That expressed by a direct ratio, or an inverse one, is precisely the fixed relation, never changing, between two fluctuating quantities, and all of these relations are independent of time. A triangle might be called an instance of relation of succession, on the ground that the sides of it are formed one after another.

The much abused expression, the power of numbers, is pure poetry. In themselves numbers have no more power than the marks in musical notation, which have no more in themselves than the eyelet-holes in a baby's cap. Leave the three things to themselves for a century—the ciphers of arithmetic, the notes of an air, and the eyelet-holes of a cap—and the first will do nothing, the second nothing, the third nothing. Apart from mind they have no power. The powers of the numbering mind are none the less, but all the more, just because the ciphers are its own invention, the processes its own operation, the discoveries its own finding out, and the utility its own benefaction to the human race; but awarding the wonder and the praise to the invention instead of the inventor, to the process instead of the operator, to the discovery instead of the explorer, to the cords in which the gift was brought home instead of to the giver, is fanciful, and, so long as it professes to be no more, is harmless. But fancies love the dress of facts, and when once they get it on, may play a troublesome part.

Under the same heading fall also relations of mere similitude. By mere similitude is to be understood resemblance of form only, as in two angles, or of form and color, as in two dolls, or else of sound, as in two noises, or other resemblance physical, intellectual, or moral, being always

such as does not involve any tie between the two correlates, but one which is simply recognized by the mind. There are relations of resemblance of a different kind. Such is that between two particles of gold, a resemblance in which kindred expresses itself by cohesion or close company. Such is that between twin-brothers, involving a living tie. Such is that between a good example and an act emulating it. Such is that between parts of a whole, all converging towards a common end, though each dissimilar in form to the others.

By mere succession, again, is to be understood succession without consequence. A swallow first passes your window and next a postman. Here is succession, as real as any other succession; but the passing of the postman is no consequence of the passing of the swallow. A horse passes, and next a cart. The succession is not more real than in the other case; but the passing of the cart is a consequence of the passing of the horse. So that "all relations of succession" form a group too heterogeneous to be of much philosophical use. For there is a third class of successions which lie between successions without consequence and successions in consequence, viz., successions from a common cause. A clock strikes one, and no stroke follows. The same clock strikes one again, and then follows a second stroke, and a third, on to ten. The second succeeded the first, and the tenth succeeded the ninth; but neither of them was struck as a consequence of the other. Each represented an additional movement of a common cause, which, had it ceased to move after the first stroke, no second would have followed; and had it ceased after the ninth, no tenth would have followed, neither first stroke nor ninth having in itself any power to call after it another stroke. The common cause which

produced the preceding stroke produced also the succeeding one. Each stroke was at one and the same time in succession to the last stroke, of which it was not a consequence, and in succession to the fall of the hammer of the clock, of which it was the consequence—successor to both, consequence of only one. This class of successions, arising entirely from a common relation to one determining cause, is of immense extent in nature and in the arts, and renders the loose classification of all successions as if homogeneous, one of the most misleading possible.

It is very remarkable that unconscious relations of this order which, viewed with regard to any tie formed between the correlates, present relation in the lowest degree, do, on the other hand, when viewed with regard to the offices they perform for the human mind in exploring the physical universe, present the very highest degree of utility. These unconscious relations are employed by reason as its silent instruments in its progress from known facts to the knowledge of things unknown. The relations between lines bounding angles, and the angles bounded by them, relations of which neither lines nor angles have any consciousness—which they cannot modify, which they can least of all so employ as from them to discover other relations—these relations have been by patient reason put to uses which have affected our noblest intellectual feats and our humblest bodily wants. When sense fails us in our quest after physical relations, then comes in the science of mathematics, a science for discovering physical facts by metaphysical processes. This description of it may not please those who have adopted the muddy Comtist notions of what are and are not metaphysics, but that must pass. We do not want mathematics to teach us that vinegar is sour, that stones are hard, nor yet that the sun is hot.

These relations of bodies to our persons are such as the senses of themselves will bring us word about, without any necessity to call upon our supersensual powers. But there exist many physical relations affecting life, and breath, and all our bodily concerns; affecting, moreover, our conceptions, beliefs, and aspirations, which lie beyond the range of our senses; rendered inaccessible, some by distance, some by minuteness, some only by our wanting of a sense fitted to serve as the medium perceiving them.

In search of these momentous relations does the mathematician set out for a march of perhaps a billion of miles, over unknown paths, and with next to no physical baggage. His base of operations may be one line, or a curve, or three lifeless angles, all of which know no more of what he aims at than do the balls in a caisson of the plans of the general. Yet such are the instruments by which his intellect and will are to carry across vacuity, and hit points inaccessible to aught else from earth; inaccessible equally to our limbs, to the birds of the air, and to the strongest winds. Yet reach those points his intellect does, and returns bearing his prizes; as when Adams sets Neptune among the stars on our banner, or Newton leads home in his modest train gravitation as his queenly captive. But if the physical materials of the mathematician are of the slenderest, his science of relations—rich store accumulated by successive feats of intellect—enables him to conquer physical facts by simple compulsion of his known relations, pointed and pushed forward till they compel unknown ones to quit their immemorial cover. Thus the fact that there is no tie, either physical or moral, between a line drawn—in the human mind, be it remembered—from that point in the earth's orbit where it was in June to that where it was in Decem-

ber, and a line connecting two stars, does not deprive of immense value and practical use the relation between the two as data for reason to work from.

Relations of velocity are relations both to space and time—so much space traversed in so much time. Such relations may or may not involve a physical tie between the correlates. The relation between the velocity of a worm in one country and that of a locomotive in another is one of mere proportion, and cannot produce any effect except in mind, which alone notes it. If, however, they two happen to be travelling on the same line, the relation may become practical, and the low relative velocity of the worm may cost him his life. On the other hand, the relation between the velocity of the axle and that of the wheel involves a direct physical tie. To say that the turning of spokes and rim is only in immediate and invariable succession to the turning of the axle, is not correct. Its succession is immediate and invariable, because it is caused and coerced. The fact that it is immediate and invariable is the index of an adequate cause, prepared to compel the sequence. That fact proves that it is not a case of succession without consequence, or of succession by consequence of a cause acting only now and then in uncertain fits. In mechanics, succession without compulsive cause may or may not be immediate. But the probability that it will be invariable is *nil*, and all experience is against its being found uniformly both immediate and invariable.

When in an engine we look on while axle and wheel revolve, we may know or not know that they have turned together this morning two hundred and fifty rounds and the sixth of a round; but we do know that when next the axle turns the wheel must turn. We know that if the axle makes two rounds the wheel cannot stop at one round

and a sixth. It will be compelled to add on five-sixths more. We may err in saying that the axle is four inches in diameter. It may be only three and seven-eighths. We may err in saying that the wheel takes five seconds in going round, it may take five and a tenth. But err we do not, err we cannot, in saying that when the axle turns the wheel must turn, and that the relation between the velocity of the one and that of the other will be regular. It is not a relation of mere succession without consequence, and we know that it is not. To say that all we know is that the succession is immediate and invariable is not correct. It is playing false to our own knowledge to say that we do not know that if the axle turns the wheel must do so; or, in other words, that we do not know that the antecedent possesses an adaptation to bring on, and even to compel, the consequent. It is the one point in the matter which we do know with a certitude admitting of no errors. And it is this which takes the turning of the wheel viewed relatively to that of the axle out of the class of mere successions without consequence, and puts it into that of effects following causes.

I may, perhaps, add that the above indicates the views I have formed on Dr. Thomas Brown's theory of causation. It is five-and-forty years since that theory first occupied my thoughts. Meanwhile, I have had opportunity of testing it by comparison with some other theories and some facts. It is a simple case of an ordinary fallacy, that of confounding what we see with what we know; what we perceive through sense with what we discern by reason. It is utterly false to fact to say that, in a case of clear causation, all we know is immediate and invariable sequence. That is all we see; but the use of our seeing it is to make us know what it does make us know, viz., that there is in that

combination of conditions and agency, which we call a cause, an adaptation to necessitate the effect.

XV.

The next order of relations, or those of the second degree —viz., relation in which, though there is not consciousness on either side, there is action on at least one side—need not take up many words. Nature is full of instances: as the sun acting upon water, a star acting on a telescope, the wind upon trees, rain upon the earth. In relations within this degree we have the same absence of moral tie as in those of the lower degree, where there is neither consciousness nor action. But we have not the same absence of a physical tie. While mere relation to space or time, mere relation of succession or similitude, may, as we have seen, exist without any physical tie, it is not so here. The action requires a connecting link, and develops other links of connection.

The next degree of relation is that which, though like the two preceding, not involving any consciousness, does involve reciprocal action. Of this the palmary instance is gravitation. Then the immense range of molecular relations is a world of reciprocal action without consciousness. More obvious to sense are mechanical relations, where action and reaction are commensurate. Here the physical tie is manifest. Here also properly come all questions of velocity, which, if contact takes place, always either generates velocity or arrests it.

We now come to a class of relations which mark a transitional stage between those of things unconscious and those of conscious agents, viz., such as fall under the head of relation involving consciousness and also action, but both on one side only. This class is of great range and

immense importance. It includes the relation of the bird to its nest and the bee to its cell, of the ox to the manger and the horse to his corn, of the swallow to the seasons and the salmon to his stream, of the dog to his kennel, the cat to her corner, the eater to his bread, the dweller to his home, and the tiller of the ground to his field. It includes, also, the relation of the inventor to his invention, of the explorer to his discovery, of the workman to his tools, of the combatant to his arms, the experimenter to his process, the designer to his patterns, the architect to his plans, the sculptor to his statue, and the painter to his picture—of the composer to his air, the poet to his verses, of the logician to his argument, the philosopher to his conceptions, the orator to his speech, and the legislator to his statutes. It includes, in fact, all the relations of thought to the unconscious handiwork of thought. It therefore, be it reverently said, includes the relation of the Creator to all nature.

The word nature being employed with limits so various by different writers, it is desirable for the sake of clear understanding to say what it means to me: it means simply all that ever had a beginning—all that was ever brought forth. This, of course, is nature in the general sense. In the restricted sense, as expressing the nature of any particular thing, what to me it means is, those particular qualities which that thing had from the beginning, and which it cannot lose without losing its identity.

In relations such as these, where there is consciousness and action exclusively on one side, it is not possible to look for a reciprocal moral tie. Nevertheless, from the moment we touch upon the mental activity of man, and on those effects of which it is prolific, moral questions arise, and begin to loom large before us. His intellectual powers in their habitual play set in motion some one or

other of the physical laws. When put forth with any stress of thought or strong impulse of will, they may set them in motion in such a manner as to generate portentous physical forces, able to compel wide-spread and long-enduring modifications of phenomena. Here, then, comes in responsibility; and the amount of happiness or misery which may be caused by such action affords some criterion of the magnitude of such responsibility. In every act whereby he impresses his own mind upon matter, man may do right and may do wrong. This is a state of things utterly unknown to the sphere of unconscious relations. Every embodiment of mind, whether in solid forms or otherwise, must bear its moral aspect. A Britannia tube is as much a work of mind as a sermon. Like the sermon, it existed in the intellect before ever it took form, and its pre-existence within the mind of its author shaped its subsequent existence when he had projected it forth from himself into an iron embodiment; just as the pre-existence of the sermon in the author's mind shaped the letters wherewith he wrote, or the sounds wherewith he spoke it, when he projected it forth from himself into a verbal embodiment. The moments of mental activity wherein the Tubular Bridge was conceived, may yield for the good of mankind at large fruitful services repeated for ages—services, also, which not only reproduce their own kind, but by the fertilizing powers of suggestion generate other kinds. And thus do the deeds of mind in ages past bear upon the state of bodies, and upon the character of thoughts, feelings, and actions now and for all time. Hence is every movement of human thought, in relation to physical nature, hung around with countless ties relating it to things before and things after, to things above and things beneath — to base possibilities, worthy possibilities, moni-

tory indications of recompense, and all solemn signs of moral control watching over moral acts.

In the next class of relations the distinguishing feature seems rather singular. It is the class falling under the head of relation with consciousness on one side and action on the other — that is, consciousness of relation on the part of the correlate which cannot act upon the other, and action upon its correlate on the part of that one of the two which is unconscious of any relation. As an instance under this head, we need mention only the relation of the pole-star to the navigators. They are very conscious of the relation, the star is not. They can do nothing for the star or to it. It serves them steadily night by night. How has that one relation affected all the intercourse of men? Yet, if every mariner who ever steered by the pole-star was now living, and all united their forces and their science, they could not convey to their benefactor, as a token of gratitude, one ship-biscuit.

Another instance under this head is that of the transit of Venus, with its relation to the minds and occupations of astronomers, as well as of instrument-makers, outfitters, shippers, and so forth. It is to be remarked that the knowledge of this event comes only to a very small proportion even of astronomers in the form of perception through sense. On the part of all the others it is knowledge by reason and testimony. On the part of the bulk of them it is knowledge by testimony alone; if you please, only belief, but belief quite as trustworthy as any sensation. The knowledge of the astronomer who never succeeded in an observation of the transit is so truly knowledge, that did he refuse to act upon it, alleging that it fell short of knowledge, he would be a simpleton, and perhaps a criminal.

XVI.

Taking the class close akin to the last, viz., that falling under the head of relation in which consciousness exists only on one side, and yet interaction is reciprocal, we may instance the relation between the mariner and his ship. He knows his ship, and can act upon her from keel to truck. She, on the other hand, knows him not, and cannot issue any command to affect him. But what action, as we say, does she not exert upon him, heaving up his person, lowering it, contorting it, and hurrying it along from meridian to meridian. In a similar way does the engineer know his engine and rule it, while it, not knowing him, bears him along. The weaver and his loom, the cricketer and his bat, and relations of succession in ten thousand forms come under this head.

Yet we cannot speak of what the captain does to the ship, and what it does to him, as being in both cases action, without feeling how widely different are the two kinds of action. Strictly speaking, what the ship does is only movement, and not action. What the captain does is to perform a deed originating in an intelligent purpose, and proportioned to the end of fulfilling that purpose. What the ship does is to yield to pressure, and transmit the movement which water and wind impress upon her to the person of the captain. In that portion of her movement which proceeds from the stroke of opposing seas the will of the captain has no part, and would gladly relieve her from it, but is unable. In that portion which is impressed upon her by the sails, it is his mind setting in motion many physical laws which brings to bear upon her a force sufficient to urge her forward. In fact, she is carried over the ocean by the human intellect, just as much

as the human body is carried over it by her. The mind makes the ship carry the body, and a thousand things besides. This is equally true if the mind, turning to the laws which govern fire and water, so sets them in motion, and so controls their operation as to make the ship resist the wind, overcome it, and pass onward against its force.

When we rise into that order of relations where intelligence stands face to face with correlated intelligence; where thought has to act upon thought, and will has to deal directly with will; where relationship means in every case something that involves a portion of the happiness of life, and in certain cases what may involve all its happiness; where action is not mere movement, to be neither praised nor blamed, but means purposed deed fraught with results to self and others, and with huge weight of praise or blame —then indeed have we risen into a sphere widely separated from that with which we began. First, we found relation which implied neither moral nor physical tie as between the things related, and which was held together exclusively by the intellectual tie within the mind of man. Then we passed on to where this intellectual tie was strengthened by a physical one, though only upon one side. Next this one-sided tie became twofold. Then came in a conscious tie beside the double unconscious one. And, finally, the conscious tie itself became twofold; so that the intellect, in saying there is a relation, feels that it has not to furnish the connection out of its own substance, but only to recognize and properly estimate it. There is here a real connection, physical, mental, moral, between the two relatives. And all these moral relations point upward above man. He is often placed at a point of awful power. We have spoken of a captain and his ship. Think of the captain and his crew and passengers! The Comtists

wrangle against "will," as if it always meant "caprice," and other undesirable things, and as if all our hope depended on being sheltered by blind laws from any of its interferences. Many hundreds of times in my life have I been in circumstances wherein my days and those of many were at the will of one ordinary man, called a captain. Often seas fit to crush us all were running, and winds blowing which none of us could still, and joints groaning, and, amid the struggle, engines revolving about whose government most of us knew nothing. Once in a transatlantic steamer I was one of eleven hundred who thus were heaved up into the wind, thrust down into the hollow, and tossed backward and forward, and all the while a single false step on the part of one man might have turned storm into destruction. Did we sigh to be saved from his will, and from its interferences with the "laws of nature?" Did the silliest girl there do so? Did the most ignorant peasant-emigrant confound that will, set there on purpose to interfere with the operation of the laws of nature, to set them in motion, and control their motion, with "caprice?" Did he confound the doing of things which his grandfather would have pronounced contrary to nature, and to all the laws of nature, with violation of the laws of nature? No; our human stay was in a single will, and in its power to hold on a sublime conflict amid contending laws of nature, aimed, as that will was, at the safety of the lives on board, just as steadily as the needle was aimed at its pole. Had the will ceased to interfere, and left us to the "laws of nature"—as well it might have been ready to do, had there been no such thing as responsibility—where had we been? We knew that will willed to bear us through, and for us the best of earthly things was that the captain's will should prevail.

So, wherever the currents of crossing laws meet, and eddy, and rage, and we ill know how to extricate the bark that bears our all, instead of whimpering out childish fears of "caprice" in One to whom this world, with all its passengers, is but as one ship in a great and thronged ocean, we shall turn us upward and say, Nothing so steadfast, nothing so pliant, nothing so tender, nothing so strong, nothing so wise, nothing so good, as Thy will, O Lord God Almighty! Where that will prevails, there prevail good relations, perfect order, perfect peace.

PART IV.

THE NATURE OF THE TWO ORDERS OF LAWS, AND THE DIFFERENT WAYS IN WHICH THEY GOVERN THE AGENTS SUBJECT TO THEM RESPECTIVELY.

It is almost entertaining to note what diverse styles of language jurists on the one hand and physicists on the other employ when they come to state what they respectively understand as constituting a law. The jurists are at home; the physicists are all abroad. Both know whereof they affirm; but the jurists also know what they say, whereas the physicists, as I hinted at the beginning, when they talk metaphysics, which they are compelled to do when speaking of law, do not always make that evident.

Perhaps I ought hardly to say physicists, for the pure physicist does not generally trouble himself with definitions. Like a sensible man, he takes terms as he finds them, and goes on with his own useful and noble work, leaving the analysis of words to alembics more subtle than any that physics set up. They who most mix up terms are mongrel metaphysicians—men who in treating of physics impose upon agents and processes the terms made to express mental powers and mental life; while in treating of mental operations they assume that these, too, are physical, and force upon forms of thought names that fit only on things which cannot think. When in doing this it is avowed that the aim is to drive away from among

men the idea of any mind above the rank of our own, it is open action. This was what Comte always avowed and gloried in; not in my words, but in words of his own, varied as far as he knew how to vary them. Some of his English sponsors veiled this glorying of his, and some tried to mystify it.

I.

What is the account generally given of that which constitutes a physical law? One favorite term is "a generalized fact." Ask a jurist or a moralist to make that definition fit upon anything to be properly described as a law! We all know that generalizing a fact is one of the easiest of mental operations, so easy that from the earliest times logicians have had to set up cautions against it, under the name of arguing from a particular to a universal. If upon a journey to-day you bait your horse at a way-side inn, he is sure to generalize the fact, and when you next pass you will have to teach him that his generalizing of it does not erect it into a law. Generalizations may be sound or unsound; and when sound they will yield us useful rules for grouping, and we, if we choose, may call such rules laws.

Another expression which comes nearer to the point is *a general fact.* M. Littré, the most distinguished of the Positivists—though scorning their travesties of a religion—says, "When we have discovered a general fact in the forces or properties of matter, we say that we are in possession of a law."* Here a law means not merely a fact that has been generalized, whether rightly or wrongly, but a fact that has been ascertained to be really general. But to be a law this must, according to Littré, be a fact in some one or other of the forces or properties of matter.

* "Auguste Comte et la Philosophie Positive," p. 42.

Only two sentences beforehand this famous scholar assumes that laws govern forces, and that laws and conditions are interchangeable terms. "We define," he says, "human knowledge as the study of the forces pertaining to matter, and of the conditions or laws which govern those forces."* Now, far be it from me to say that laws do not govern forces; but general facts do not govern them. General facts are the product of forces, and depend upon them instead of presiding over them. When in the same breath those so-called laws for which we are gravely counselled to give up the study of causes and designs in order to set laws alone before us as the sole object of research, because, forsooth, they only are accessible—when these are called by three names which mean things so broadly distinguishable as conditions, general facts, and laws—I feel two things, first, that if accessible to the rest of us, they elude the writer; and, secondly, that while such writing is very like that of the Positivists, it is very unlike either sober science or sound philosophy.

A mere general fact is not enough to make what all mean by a physical law. It is a general fact that persons going from London to Edinburgh set out northward; but it is no law. Any gentleman may face westward and go by Bristol. To be the index of a physical law, a fact needs to be more than general — to be universal and without exception. The fact that the mariner's compass points northerly and southerly is such a fact. It indicates a physical law; and by a very usual figure of speech is called a law.

* "Nous le definirons [le savoir humain] l'étude des forces qui appartiennent à la matière, et des conditions ou lois qui régissent ces forces."

A very ordinary description of a physical law is "an observed order of facts." This formula rightly assumes that not a fact only, but facts, must be in view; and not facts in promiscuous relations, but facts set in order. But to make facts set in order into a law, it requires that the order be "observed." If a law is an "observed" order of facts, what is an unobserved order? Before the day of Harvey the circulation of the blood was an order of facts as much as it is to-day; but it had never been observed. Was there then no law of the circulation of the blood? Before Newton, gravitation was an order of facts as much as it has been since. Did he make the law when he observed the order of facts?

II.

It is strange how often, in the writings of the Positive school, the word relations coupled with varying epithets is employed as if interchangeable with law. "Invariable relations of succession and resemblance" is the key-note of this scale; but "constant relations," "effective relations," "real relations," "immutable relations," and such like terms are jingled in your ears as if the music was to charm you into thinking that they must mean at least as much as laws. A faithful and trusted expositor of Comte, Dr. Robinet, holds this seesaw language: "The constant and general relations which these diverse categories of events affect among themselves—that is to say, the laws that govern them."* So in the same sentence we have laws described as what govern the events, and also as what

* "Les rapports constants et généraux que ces diverses catégories d'événements affectent entre elles, c'est-à-dire, les lois qui les régissent."—*L'Œuvre et la Vie d'Auguste Comte*, p. 18.

the events affect for themselves; and such laws as these are the solids that are so "accessible." What idea is here attached to the word "affect" I do not know — some vague one, as usual in this school, whenever it rises to anything above measures and numbers. Dr. Robinet may have meant something akin to natural selection, or sexual selection. He and his fellow adepts habitually speak all in a breath of a law as "being" a relation, or as "establishing" a relation, or as "expressing" a relation, or as "ruling" a relation and do it apparently without thinking that there are some people to whom "being," "establishing," "expressing," and "ruling" mean something not so misty as to leave it a matter of indifference which word comes first.*

* Robinet appears to intend to give so careful an exposition of the Positivist doctrine in respect of laws as shall definitively settle the views of philosophers for all time. Within seven pages we have the following: "The essential character of real laws is abstraction. . . . The abstract laws which govern the different degrees of existence. . . . Special or concrete laws of the atmosphere remain so far unknown to us as to hinder prevision. . . . Astronomy reveals its real laws. . . . No laws but abstract laws are accessible to us. . . . Natural laws always consist in an inductive notion. . . . The relation concerning succession and similitude which phenomena affect among themselves. . . . Laws of succession express an invariable relation between events distinct in nature. . . . A true law does not really affect anything but two phenomena in reciprocal relation. . . . Laws of similitude establish the relations of similitude which exist among observed phenomena. . . . A law is then, finally, the invariable relations existing between two phenomena distinct in their nature, according to which the one varies by means of the other, with a degree of intensity depending on the circumstances amid which the action takes place. The law represents constancy in variety." After this final definition come incidentally the following: "Natural laws are conceived of as simple general facts not admitting of any explanation, by serving as

The formula used by Mr. Mill to describe what he does not call by the limited term physical laws, but by the vast and undefined one, laws of nature, is one of the most awkward of all. Having remarked that a certain fact invariably occurs in certain circumstances, and does not occur without them, he says that this constitutes what he calls "a uniformity;" and that whereas other facts show the same constancy, this constitutes not a uniformity but uniformities, he goes on thus to define: "These various uniformities, when ascertained by what is considered a sufficient induction, we call in common parlance laws of nature." Thus, in teaching logic, does he endeavor to confine the ideas of laws of nature to mere dead uniform sequences, chiefly mechanical. To make this clear he adds, "The following are three uniformities, or call them laws of nature: the law that air has weight, the law that pressure on a fluid is propagated equally in all directions, and the law that pressure in one direction, not opposed by equal pressure in a contrary direction, produces motion which does not cease until equilibrium is restored."*

What Mr. Mill's definition required was not that he should make it appear that certain physical laws could be called "uniformities," but that he should make it appear that all uniformities in nature, ascertained by a sufficient induction, were fit to be called laws of nature. This, if it

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a basis for all rational explanations. . . . Every law results from an external observation and an internal conception—that is, of an objective element supplied by the universe, and a subjective element supplied by the brain."—*L'Œuvre et la Vie d'Auguste Comte*, pp. 22–29. So when there was no brain upon earth there was no law of gravitation; and when there was no eye, there was no law of light determining the angles of incidence and reflection.

* "System of Logic," vol. i., p. 365.

is to amount to much, requires us to know where nature ends and art begins, and where both nature and art end and the supernatural begins.

To take Mr. Mill's specimen laws, all three are properly selected, being not merely general facts, but universal ones. They are also selected from among the spontaneous phenomena of unconscious physical agents. He draws only from that province of nature which cannot move by volition, not even by growth. It is indeed universally true that air has weight. It is universally true that pressure on fluids is propagated equally in all directions. It is also universally true that pressure on a body in only one direction produces motion. And, further, it is universally true (for Mr. Mill's three propositions are really four) that motion once produced continues till equilibrium is restored. So long as the agents are without life, uniformity is easy. Now, seeing that Mr. Mill selects only lifeless agents by which to test his idea of nature and of the laws of nature, he very easily indeed finds that the pressure exerted, and the resulting motion, are, under identical circumstances, perfect "uniformities." But suppose, instead of setting air to press upon a liquid, he had set a duck to swim upon it, who could prescribe "uniformity" to the pressure to be exerted upon it? Who could tell how rapidly or how slowly motion would have to be propagated all over the pond? Or suppose that you have a liquid with a child blowing it up to make waves, who will tell us the "uniformities" of pressure? Are not the duck and the child as much part of nature as mercury and air and a glass tube? as much subjects of law as a barometer? Mr. Mill holds that "the expression, the laws of nature, means nothing but the uniformities that exist among natural phenomena." Now, is it not as much a natural law that the

action of a child's lips, when blowing his milk into a tempest, shall be no uniformity, shall be beyond all dead-levels, as it is that the pressure of gravitation shall be uniform? The "uniformity" in natural phenomena of living agents shows itself in contriving that each one of them shall be different from every other one.

Is not "multiformity" a law of nature as well as uniformity? I do not mean multiformity in phenomena of different sorts, but in repetitions of the same phenomenon. Every bowlder is like every other bowlder, but is it uniform with it? Every hill is like every other hill, but is it uniform with it? Every star is like every other star, but is it uniform with it? Every sunset is like every other sunset, but is it uniform with it? And so on with every storm, every night, every thunderclap, every tide-wave, every ripple of the sea, every throe of an earthquake, every shower of shooting-stars, every display of the aurora borealis, every lode of copper, every nugget of gold, every bed of coal, every block of marble, every quarry of slate. These cases are all taken from Mr. Mill's own level of things lifeless. But this law of nature does not change when you come to compare every moss with every other; every grass, every exogen, every endogen, or—keeping to species—every oak with every other oak, and every oak-leaf with every other oak-leaf, and so forth. In the animal world the law of "multiformity" is conspicuous in every face, every voice, every gait, every plumage. The three "uniformities" cited by Mr. Mill illustrate nothing beyond the sphere of mechanical causes producing mechanical effects, and leave large and elevated regions of the realm of nature out of view.

But even handling these chosen examples, Mr. Mill, in order to show them in combined action, presents them in

the barometer. Is this a mere piece of mechanism? Yes, but where had been the mechanism without a pre-existing mind, capable of setting in motion laws of mechanics, and of compounding the forces that play under them, so as to make an instrument which knows nothing and tells much —that is, tells much when it has a human mind for hearer; but tells nothing to the mind of the dog, whose eye sees it quite as well as that of his master, and receives from it the sensations which it can give, just as well as he.

III.

Dr. Robinet sees farther than Mr. Mill in this passage shows himself to see. Dr. Robinet fixes the "uniformity" not in the phenomena themselves, but in the relation between them. He knows that though the weight of the column of air to-day is one, and to-morrow another, and though the corresponding height of the column of mercury is equally variable, nevertheless the uniform relation of equality in weight is maintained between the two varying quantities. But, on the other hand, Mr. Mill slips incidentally into a better description of a physical law than any I can recall in either Comte or any of his French exponents, "Natural phenomena have their separate rules or modes of taking place."*

* This expression, equally with that of "uniformities," is the natural result of modes of thought to which any admission of intelligent control is repugnant. An equally characteristic phrase in the same chapter is this: "From these separate threads of connection between parts of the great whole which we term nature, a general tissue of connection *unavoidably weaves itself*, by which the whole is held together." The italics are mine. The whole is nature. It is held together by a tissue of connection. This tissue weaves itself unavoidably. The thread with which it unavoidably weaves itself is

Mr. G. H. Lewes was made by some objector to feel the inconvenience of the word law. It was shown that in all common-sense such a word involved some notion of authority and government. Mr. Lewes thought that it had better be dropped out of scientific terminology. He proposed to substitute the term method — of which one is reminded by Mr. Mill's "mode."

Mr. Herbert Spencer re-issues the "uniformities" in his own dialect, "the constancy of surrounding co-existences and sequences. Familiarity with uniformities has generated the abstract conception of uniformity, the idea of law."*

Professor Helmholz† declares that "law is nothing more than the general conception in which a series of similarly recurring natural processes may be embraced." Thus law is not a fact in external nature, nor facts, nor order in facts, nor uniformity, but is a "conception," a general conception, a state or act of mind. In thus making the definition purely subjective, Helmholz is in distinguished and numerous company, composed of both metaphysicians and physicists. But as his company are in the habit of doing, so does he pass from this mystic ground into other and more practical. Set him to work and he goes right, as naturally as when he sets himself to verbal analysis he goes wrong. "Before we can say that our knowledge of

the various threads of the laws, or "uniformities." We are not told what plant or animal grows the raw material of the threads, *i. e.* the uniformities. They presumably spin themselves as the web weaves itself; but what do they spin themselves out of? This mindless loom, in which unavoidables work up uniformities into a web that holds us and all things together, is set in motion under guise of teaching logic!

* "First Principles," p. 142.

† "Popular Lectures on Scientific Subjects," p. 370 *et seq.*

any one law of nature is complete, we must see that it holds good without exception, and make this the test of its correctness." What Helmholz means is not the test of the correctness of a physical law, which is sure to be correct, and not to need any amendments. He means the test of the correctness of a "conception." This testing can be done only by the mind that entertains a conception of the law as being such and such. But no sooner does that mind reduce its conception to an expression, than others can see whether or not the rule laid down holds good without exception, and can make that the test before accrediting the formula, as a scientific discoverer will take good care to make it the test of his conception before committing himself to a formula.

Helmholz, dealing with physics, takes a more dynamical view of the meaning of law than does Mr. Mill, dealing with logic. "If we can be assured," he says, "that the circumstances under which the law operates have presented themselves, the result must ensue without arbitrariness, without choice, without our co-operation, and from the very necessity which regulates the things of the external world, as well as our perception. The law then takes the form of an objective power, and for that reason we call it *force.*" It is in this dynamical sense—the sense, that is, of working power—that he speaks even of "the law of the immutability of matter" as a force, a power, which, amid unnumbered forms of change, place, and appearance, resists any real change of nature, so that the particle comes out again identical with its original self.

It is also this view of law that is presented in three out of the five categories into which the Duke of Argyll classes the popular uses of the term law. In one class the term means a force, merely discerned as being involved in some

observed order of sequences. In a second, it means such a force as more or less measured and defined. In a third, it means a force or forces in some combination for the fulfilment of a purpose. These three meanings, fairly deduced from current uses of the term law, all display the notion of it entertained by those who so speak as running on a lower level than the description of Helmholz. It is lower in this point of view. It speaks of a force itself as a law; and it makes it evident that by force is meant not intellectual, moral, or will force, but some physical force, as gravitation, magnetism, or the like. Now Helmholz, instead of speaking of a force as a law, speaks of a law when viewed objectively as a force. A law which is a force implies an intellect to proportion force, and a will to impose it. A force that is a law may be so only in the sense in which the explosion of the powder is a law to the ball—that is, it is a resistless movement.

Dr. Carpenter says that it is altogether unscientific to speak of phenomenal laws—by which I assume that he intends physical laws — as governing phenomena. His reason, as given for this opinion, contains a description of those laws. They are "nothing but comprehensive expressions of aggregates of particular facts, giving no rationale of them whatsoever."* Whether this means that the law taken objectively (that is, viewed in itself) is an "expression" of aggregate facts, or that taken subjectively (that is, as viewed in the conceptions we have, or the formulas we make of it) is an "expression," I am not sure. Probably Dr. Carpenter meant to speak in the objective sense, which is, doubtless, the sense often intended by the writers of a school against which Dr. Carpenter does good service,

* "Mental Physiology," p. 693.

when to ordinary readers they might seem to mean formulas. If I am right, the law would then, according to Dr. Carpenter's view, simply express to us the aggregate of facts, without expressing any principle on which they were aggregated, or any power causing their aggregation. Our expressions of the law, whether that of some one of us to his own mind, or that of one to others, would be a different matter. Dr. Carpenter hints that it might not be amiss if the term "law" could be altogether banished from science. One suggestion made by him is not only strictly philosophic, but of practical value. "In regard to the physical universe, it might be better to substitute for the phrase "government by laws," "government according to laws."*

Professor Huxley in his lay sermons gives as a definition of law a modified version of Helmholz's description: "Law means a rule which we have always found to hold good, and which we expect always will hold good."† This seems to be a good account of a physical law; at least it is so if that which, for a long stretch of years, I have always used is good, namely, not a law in the proper sense, but a rule that cannot be broken. This Professor Huxley would weaken into, "we expect will always hold good." But Helmholz does not say too much in saying, "holds good without exception."

IV.

In these widely differing views there is greater confusion in appearance than in reality. One reason of this is the practice of using at hap-hazard terms which, on the one hand, describe a law when viewed as determining the method of natural processes, and terms which, on the

* "Mental Physiology," p. 706. † P. 340.

other hand, describe it when viewed as conceived of in our minds. Sometimes it requires practised eyes to tell whether a writer, when he speaks of a law being "established," means made and set up over its domain, or only means verified to the satisfaction of men of science, and embodied by them among their recognized statutes. Perhaps, of all writers, those of the school of Comte in this respect most need careful interpretation. Another cause of ambiguity is the use of abstract terms with concrete meanings. This use, encouraged by French and German idiom, occasions in either language little ambiguity. But Mr. Mill has not the same excuse when, in our English, he employs the abstract term "a uniformity" to name the concrete object, a uniform order of sequences. Another source of obscurity is the consciousness—felt by writers in proportion as their discernment is acute—that in using the term law, they are borrowing the name of a thing to which it fits, and putting it upon a thing on which it does not fit. The reasoning of John Gilpin's friend was ready, but not logical. The hat and wig would do, because "my head is twice as big as yours, they therefore needs must fit." No, not so, they therefore needs must go on, but they might be so far from fitting that they would come down over the eyes. So it is with the term law, when set upon the head of physical rules. It is made for a head twice as big. It will go on if you please, but it will interfere with clear-sightedness.

Amid all these variations, one pervading coincidence of view is manifest. All the writers feel that by law in physics they mean something which somehow represents order among physical agents, and enforces a perfectly trustworthy constancy in the sequence of cause and effect given only similar circumstances. The immutability of every

agent in its own qualities, and the uniformity of changes under like causes of change, are two points present to all. To some the idea is welcome that order here, as on every field where we can physically verify beliefs, represents an ordainer, and that the embodiment of rules of proportion and modes of procedure in agents themselves incapable of design, purpose, or adjustment, represents a ruler capable of all three. To others, such a belief is the black beast to be escaped from by doubling round any corner, by hiding your eyes in any heap of sand. Such men must refuse to call a cause a cause, it is an antecedent, as your shadow is when it goes before you; and they must refuse to call an effect an effect, it is a consequent, as you are when you follow your shadow. Mr. Mill's celebrated definitions of Matter and Mind afford a curious example of the ease with which he slipped into subjective for objective, just as in his "uniformities" he slips into abstract for concrete. Matter is a permanent possibility of sensation—Mind a permanent possibility of feeling; that is, Matter is defined on the objective principle, and Mind on the subjective. Suppose it read, Matter is a permanent possibility of experiencing sensation, and Mind a permanent possibility of experiencing feeling! In this form it is plain that the definition of Matter is nonsense. The clink of the words carries the writer over from the one side of his subject to the other without his being aware of it. Define a face and a mirror as he defines Matter and Mind, and you would define them a permanent possibility of reflection and a permanent possibility of reflecting. Mr. Mill meant that Matter was a permanent possibility of causing sensations, and Mind a permanent possibility of experiencing feelings, of which sensation is one sort, not, as his father used to contend, an identical expression. The collective abstract

form "sensation" had something to do with this tangle. Either "a sensation" or "sensations;" any concrete form would less flexibly have yielded to the false turn of the hand.

V.

When we pass on to note what the jurists take to constitute a law, it becomes plain sailing. Mr. Austin, in his "Province of Jurisprudence," calls a law "A rule laid down for the guidance of an intelligent being by an intelligent being having power over him."* Mr. Austin holds that laws set by God to men, which are frequently styled the law of nature or natural law, are in truth the only natural law of which it is possible to speak without a metaphor, or without a blending of objects which ought to be distinguished broadly. He therefore rejects, as ambiguous and misleading, the term Law of Nature. He complains that there are in currency numerous metaphorical uses of the term law, which involve a flagrant misapplication of a name, and through which "the field of jurisprudence and morals has been deluged with muddy speculation." Instances of this misapplication are specified, such as when we speak of laws determining the movements of inanimate bodies, or laws determining the growth and decay of vegetables. He even holds that speaking of laws observed by the lower animals is an instance of similar misapplication; for, he argues, where there is not intelligence, or not enough to conceive the purpose of a law, there is not the will which law can work on, or which duty can incite or restrain. Every law or rule, continues Mr. Austin, is a command. Every command implies not a mere intimation of desire, but an in-

* Vol. i., p. 88.

timation, coupled with power and purpose on the part of the person commanding, to inflict an evil if the desire be disregarded. Such a command entails an obligation or duty. Breach of the duty brings with it the penalty. No conceivable motive will render obedience inevitable. The menace of a penalty constitutes the sanction of the law. On this point Mr. Austin would not join with Locke and Bentham in regarding as also forming part of the sanction a reward, if one be promised. The reward he holds to be only a motive to obedience, and the sanction of a law to include properly nothing but the penalty for disobedience.

VI.

Here we have passed at a bound from one realm to another, from the realm of the lifeless to that of the living. Here the constituent elements of law are intelligence, authority, will, motives, power to act, and to modify phenomena, and free choice of obedience or disobedience. Every one of these ideas, when imported into the realm of physics—if there is no intelligent ruler there—is mere rhetoric, and rhetoric which does not illustrate, but misrepresent. There are those of us to whom the only refuge of reason, amid the maze of infinitely crossing yet perfectly co-operating physical laws, is the belief in an All-Wise and Almighty Ruler, whose immovable decree is embodied in every separate law. But we know that we should impose upon our own understandings if we imported the ideas of intelligent agency into the properties of those agents which obey physical laws, and work them out. We can bring in, to explain their movements, intelligence and will only upon one side.

Law, according to Austin, involves intelligence in the law-giver, and intelligence in the subjects of law. It in-

volves on his part authority to command; on their part, consciousness of that authority; on his part, power to give a motive; on their part, susceptibility of feeling a motive; on his part, the will to exercise authority for a specified purpose; on their part, power to conform to that purpose, or to refuse so to do. Austin holds that under law, properly so called, disobedience not only is possible, but must be so in spite of any weight of motives. But in thus holding that the moral agent is free to break law, does he hold that he is able to alter the law? No. Does he hold that, in being free to break the law, he is able to annul it? No. Law it is if kept, and if broken, law it abides.

VII.

The rudimental opposition between the idea of physical law and that of moral law is sharply thrown up by Professor Sheldon Amos,* without any intention to do so, his leaning apparently being to accept the current notions about government by law without strictly scanning the bounds between the two domains. Properly assuming that in the sense of his book law means political law, he defines it as "a body of commands formally published by a sovereign political authority." This definition includes in germ whatever we have collected from Austin, with the additional and important element of publication. That element in our laws represents the appeal of intelligence to intelligence; the communication of the mind of the law-giver with the mind of the agents subjected to the law. So it does in divine law. The modes of publication in any case must depend, first, on the nature of the law-giver; secondly, on that of the agents subjected to the law. I

* "Science of Jurisprudence," pp. 1, 2.

have assumed that publication implies intelligence above the law, and also intelligence under it; intelligence in the law-giver, and also in the subjected agent. The rule of intelligence above the law will hold good invariably; that of intelligence below the law will hold good invariably for moral agents, but not for unconscious agents, and not even for non-intelligent agents. But we may well conceive publication which does not appeal to intelligence in all the subject agents, yet does so in other agents related to them and to the law. The most intelligent birds and beasts in England knew nothing of the event which to men was the publication of the law on cruelty to animals. Yet the event was a real event to them, a real phenomenon in their relations with the physical forces around them, and with the moral forces which dominated both animal and physical forces; a germ phenomenon bearing fruit after its kind. So, to-day the law last promulgated in the House of Lords is a total secret to the most highly trained dog that keeps watch in the legislative palace; nevertheless, it may be of vital moment to the interests of many dogs. No sensible dog would be enough of an agnostic to say that, as the law was inaccessible to him, he could not know it, and as he did not know it, he would push the idea of it aside as a theological fiction. The law would become known to him, as far as he could know it, in modes suited to his intelligence; it would find him out in its action, whether for restraint, constraint, or protection.

But it was not to this I alluded in noting how Professor Amos brings out the salient point of opposition between the very conception of the two orders of laws; it was to what follows: "The presence of law implies the opposition to each other of two different sets of persons in the community." These two "sets of persons" he describes

as consisting of, first, those who devise the law and impose it, and, secondly, those on whom they do impose it, and whom they will punish in the event of the law being disobeyed; for, affirms Professor Amos, "every law contemplates the possibility of an act of disobedience to it, and every act of alleged disobedience to a law entails certain inevitable consequences."* This is quite sufficient for my purpose; but mark the next: "A law is only capable of being addressed to persons who are able to obey or disobey it at their will."

Now this fact that a law, in the proper sense, is capable of being addressed only to persons able to obey it or disobey it at will, is a scientific fact, just as much as that a ray of light is capable of being transmitted only through a transparent body. But this fact in true laws, and it is in the marrow of them all, that they cannot be imposed except upon agents capable of disobedience, is of a nature so sweeping that it puts all the rules of proportion found in physical agents, and the modes of procedure found in physical processes, clean beyond the pale of law. These agents and processes work in irremovable chains for the whole term of their natural existence.

Just imagine every physical rule contemplating, as Professor Amos truly says every moral law does—for I at once extend his term "political" to the wider range—"contemplating an act of disobedience." Imagine gravi-

* "Alleged" or not, every act of disobedience entails consequences. The disobedience entails liability to detection, detection entails liability to accusation, accusation liability to conviction, conviction liability to penalty. The least an offender can have to endure is liability to detection. That alone has often sufficed to bring a man to the grave. But at each step of the chain the thing actually entailed is liability to an evil, not the certainty of it.

tation contemplating bodies that now and then refuse to gravitate! Imagine temperature contemplating bodies which generally will expand and contract by rule, but occasionally may take a bad turn! And more grotesque still, if less obviously so, imagine physical rules which the party devising them does not impose upon the party bound to carry them out in any other way than by a command and a threat of punishment in case of disobedience!

Physical rules do indeed involve two parties—one to devise and impose them, another to carry them out—that is, they involve the first as well as the second, unless all cases that come within the range of human experience are to be declared irrelevant, and unless every habit of reasoning which entitles man to be called reasonable is to be given up in order to help us to close our eyes to the evidence that there is a Power above us, and to help us to believe that humanity is our sole providence—that same humanity that can no more bring us back the daylight, now that it is waning, than it could make for us new sun, moon, and stars.* But whether physical rules do or do not clearly presuppose a wise and mighty Author, they have their own characteristic, namely, that the second

* A favorite Positivist axiom, *Seule providence de notre terre* (Robinet's *Comte*, 37). La seule Providence réelle de notre Terre, celle de l'Humanité, à la fois matérielle, sociale, intellectuelle et moral, suivant, qu'elle émane des patriciens, des proletaires, des prêtres ou des femmes (*Id.*, p. 50). It was well to give the original of this; but I subjoin the English: "The sole real Providence of our Earth, that of Humanity, at one and the same time material, social, intellectual, and moral, according as it emanates from the nobles, from the poor, or from the priests and women." The words Poor, Patrician, Priest, all have a special sense in Comte that common language cannot convey. Comte's own practical use in politics of this principle will appear hereafter.

party to these rules is utterly incompetent to read, mend, mar, or break them. In the great laboratory of law such rules are the plant absolutely necessary to the processes, but they are not the forces, they are not the operators, least of all are they the directing mind which has to say what the operators are to aim at, what forces they are to set in motion, what measure of each they are to apply, and what crossing and intercrossing of these forces they are to conduct to a result which they, much as they know, no more foresaw than did the forces themselves. To change the illustration, and take one from mechanics employed in the commerce of thought: These physical rules are as necessary to the reign of law as are printing-presses, types, and ink to the reign of literature. They, however, can no more do what requires the joint action of fixed instruments and free agents than can the plant of a printing-office compose, make mistakes, correct, and work off impressions, except in the measure in which it is fitted so to do by the invention, adjustment, and moving power of mind.

VIII.

As to describing the distinctions between moral law, in the broad sense, and political law, as defined by the two scientific jurists quoted, only a few moments need to be taken up in doing that. The definitions of the jurists suffice clearly to indicate the essential qualities of a moral law. It is a law given by an intelligent being to an intelligent being to specify and determine his proper relations, first, to other intelligent beings, secondly, to non-intelligent creatures, thirdly, to unconscious things, and finally, to specify and determine his relations to the Law-giver, in case of obedience on the one hand, and of disobedience on the other. Such law goes into force by virtue of the mere

authority of the Law-giver. Authority means the recognized right of one intelligent being to command another. Seeing that authority by itself moves only mental and moral forces, and not physical ones, the law assumes, on the part of those subjected to it, capacity, on the one hand, for comprehending its practical intent, and, on the other hand, for complying with it, or refusing compliance. It assumes, moreover, the existence in them of a conscience of right and wrong, and of the love of good and the dread of evil, and appeals to these as moving powers — to the conscience by simple manifestation of the right and wrong, and to the hope and fear by the promise of good in case of obedience, and the threat of evil in case of disobedience. The feeling of the superiority of right to wrong awakened by simple presentation of the two in contrast, and the hope and fear awakened by the promise and the threat, constitute the working forces of the law, whereby to impel to obedience and draw off from disobedience.

Such law, then, being imposed only by authority, and not by resistless force, admits of being broken, and even contemplates the occurrence of that case. But though broken, so far is it from being annulled, that thereupon the authority which gave the law calls up force to vindicate it, though force had not been employed to impose compliance with it. Force does vindicate it by inflicting the penalty. The threat of penalty is the sanction of the law. Corresponding with this, and co-operating with it, is the prospect of reward for obedience. Even when no specific reward is set forth, every law implies the most comprehensive of all forms of reward, that is, the upholding of the doer of it in all the rights and privileges of the innocent.

To consider a moral relation as existing merely between

the two parties themselves, without any tie between each of them and a third party to whom both are bound, is a fundamental error. It is of the essence of moral law that, whether the other party to the relation is able to vindicate his own rights or not, those rights repose on the authority of one who is able to do so. It is also of its essence that whether the other party is or is not conscious of his rights, whether he be a babe, or asleep, or in a faint, or in a state of coma, his rights repose on the authority of one who is not asleep, or absent, or bribed to leave his post.

The simple precept in Leviticus which enjoins the leaving of gleanings for the poor, illustrates this principle of the Mosaic moral laws. Nothing is said by way of reason, sanction, or promise but this: *I am the Lord;* Lord of the hungry widow and also of the full land-owner; Lord of the one lost ear as well as of the gathered shocks, the overflowing barns, and the empty winds on which these depend. This ennobling formula, *I am the Lord*, returns over and over again attached to very common actions in domestic and trading life, thus lifting up, as by a thread of light and goodness, the lowliest movements of a moral agent into direct connection with the throne of all majesty, and placing at the same time the secret titles of the most defenceless holder of any rights under protection of the thunders, and the lightnings, and the voices which are evermore proceeding forth from that throne of the supreme Right-holder—of Him who gathers up into His own hand the rights of all living, in such manner that whoever violates the least of them has to count with two holders of rights instead of one; not only with him who holds equal rights, but also with Him who holds superior ones; not only with him whose title is to justice, but also with Him whose title is to gratitude, fear, and obedience;

not only with him whose sole might is weakness, but also with Him whose might is that of Eternal Power and Godhead—covered over with whose wings weakness lays it down, and, quietly sleeping, smiles, inarticulately conscious of unresistible might.

IX.

Having now the two orders of law face to face, we may begin to take some review of the points wherein we have found them to agree with one another, and of those wherein we have found them to differ. We saw at the outset that the fundamental point wherein they did agree was this, that each of them determines an order of relations—the physical laws determining the order of relations as between unconscious agents, the moral laws determining it as between moral agents. As are the agents so are the relations determined for them respectively. The relations of unconscious agents are fixed and inviolable. The relations of moral agents are also fixed, but, fixed otherwise, not as inavoidable, but as normal. In other terms, the relations held towards one another by agent and agent under physical law are uniformly identical with those determined by the law; whereas the relations held towards one another by agent and agent under moral law, may widely differ from those determined by the law. Hence do we discover two diverging senses of the word determine, the one meaning to render a certain course inevitable, the other meaning to render a certain course obligatory.

These two lines of law run together in continuous parallelism, the one winding where the other winds, the one tending to whither the other tends, just as the two coordinate lines of the railway and the telegraph run side by side, the one transmitting impulses which convey commands, whereas the other only transmits impulses that

convey weights, each working under a law that the other owns not; both, however, co-operating to the common end of providing uniform instruments for free agents, and of assuring to the moral agent control over instruments having laws of their own—laws which the moral agents did not set, and cannot either break or evade, but which they can move.

It would not be more vain to attempt to work the telegraph by steam than to evolve a sense of moral obligation by physical law. It would not be more bootless, on the day of a great victory, to ask the locomotive to report in Paris and New York, Sydney and St. Petersburg, Calcutta and London, that the battle was fought and won to-day, or to ask the telegraph clerk to convey a thousand wounded men on his wires, than it would be to attempt to rule any physical agent by word of command. Both telegraph and railway show the co-ordinate action of the two kinds of agents under the two kinds of law; in each case displaying a system under which things very unlike are necessary to complete one another, and under which government according to two different principles is harmonized to effect common ends. As the terms imply, the inviolable relations of the physical agents are uniform, while the normal relations of the moral agents though not uniform are ascendant, and only on these two conditions can order be built up.

X.

A second particular wherein the two orders of law concur is this: no law in either order can be annulled by any power of the agents, subject whether to that order or the other. The difference between the two does not reach so far that a moral law in being broken is abrogated. In itself, without any such dread possibility, the difference is

of momentous weight. A moral law can be broken really, and not only in the metaphorical sense in which, as we shall see, men talk of violating physical law. It can be deprived of its control over its subjects. That which it determines ought to be done can be left undone. That can be done which it determines ought not to be done. In every case wherein either of these takes place, its control is actually suspended, and the province which ought to be ruled according to it is not so ruled. The force of motives, which is the operative force of the law, has been encountered by an opposing force of will, and the will has prevailed against the law; action has followed the course of will, and interrupted the operation of a law.

Interrupted the operation of a law! that is a very terrible word, for he that has frustrated a law has done a thing that ought never to have been done. Here, then, we come again upon the same thought as we had before us a moment ago—the union in one operation of the unconscious instrument and the conscious agent. Where is the body that can break a law? Not in the deep sea, heave as it may; not in the wind, rage as it may; not in the fiercest thunder, not in the most stealthy earthquake, not in the hardest metal, not in the swiftest beam of light. Where is the body that can break a law? Where the body that can make God's pure air be the messenger to carry a lie? Where the body that can make God's good gift of iron be the tool to steep God's very bountiful clay in the blood of murder? Where is the body which, when the voice of rightful law says, Thou shalt! can make answer, I will not? and when the same sacred voice says, Thou shalt not! can make answer, I will?

The experience of mankind has brought to light but one body placed thus in the supremely awful position of

liberty to break law; and that is the body which, wedded to the soul of man, forms the final tie between the unconscious instruments and the moral agents, and works to the human will as does the telegraph wire to the will of the operator.

But, when the offender has done his bad act, where does he stand? over the corpse of a dead law? over the grave of a buried authority? No, the law which before seemed only as a thing that could be set aside, now dilates into an immutable power that can never be put away. The authority, which before seemed to allow of resistance, now stands up armed against rebellion. Before his crime the agent was under the law, which, if it was for restraint, was also for protection, and, if it called for effort, held out a great reward. After his crime he is not less under the law than before, but under it for penalty and shame. He that thought to do proudly in setting himself above the law, feels that never before did he creep so low as he does now under a weight that is going to crush him. A law kept is gentle as a nursing mother; a law broken is more terrible than an angry giant. You have seen three men together walking down the street; in the midst a policeman, on one side an honest man, on the other a thief. All three were under the law—the policeman as its organ, the citizen as its care, the thief as its prisoner; two protected by it, one led captive, and the strength of the law was felt by the transgressor more intensely than either by its own officer or by the man of whose goods it was the defence, and in like proportion was felt the sting of sin.

XI.

Passing on to look at points in which the two orders of law differ from one another, the first, suggested by what has just been said, is this, that whereas moral law represents two wills, physical law represents but one. We cannot conceive of any real law but as a command having an intelligent law-giver above it, and an intelligent agent under it. But this last idea is not only foreign to our conception of physical laws, but also repugnant to it. They rule below the living realm where will responds to will. They govern agents who never change their views. Command, as we already have seen, is not language known among things unconscious any more than prohibition. It is their want of will which deprives "Thou shalt" and "Thou shalt not" of any possible influence with them. "Be" was the word that made physical agents, and "Be, after thy kind," fixed forever their properties and capabilities.

Such agents without will would have composed the sole system of the universe had its Head been pleased only to be a maker of unerring machines, or an impulse beginning perpetual motion. But He willed to be Father of beings possessed like Him of the power of thinking, feeling, and acting. He committed to these beings the most dread faculty of breaking law — among finite powers the one that towers above all others, like some weird summit, half hidden in the skies.

It is very strange how the question of free-will has often been transferred from its natural ground to one widely separated from it. The test of freedom of the will has been placed in power perfectly to fulfil the laws of God; and as in fallen man this was not found, he was held to be without free-will. But what this proved was not

necessitated action, but liberty to break law; not the absence of free-will, but the absence of moral ability. Had a breach of law never taken place in any world, the question of free-will could never have arisen. No amount of uniform action would prove freedom to break law. Universal uniformity would appear to be all but conclusive proof of universal necessity. The thing proved by moral feebleness was not that the sinner sinned by compulsion from on high, but that when his inner man saw and approved the right, his conscience was not master of his feelings, habits, and temptations, but fell before them, and allowed him to be carried captive of the evil he could not help condemning. The fact that a drunkard ashamed of his vice, and afraid of its consequences, cannot pass the public-house without having a firmer will than his own to carry him past, proves that what he needs is one to be to him strength and will, but does not prove that he is compelled by stress of predetermining forces to go in and drink. The very fact that a stronger will suffices to hold his up is evidence that the freedom he required was not freedom as against higher powers, but freedom as against depravity of habit and infirmity of will.

XII.

The mystery of how will impresses itself upon other wills is great, but perhaps that of how will impresses itself upon unconscious matter is still greater. How is it possible that substances without any knowledge of what a mind intends, and without any power of responding Yea or Nay to an impulse of will, shall, nevertheless, take on from that will the impression it purposed to make? and, still more, how is it possible that they shall retain for a long time, perhaps for ages, the properties wherewith the

will desired them to be imbued? What we know upon the point amounts to this, that in regard of matter, and even of finite wills, these things are so. By his will man cannot make matter, but he can mould it. If we take a substance which, had it never met the eye of man, would have lain undistinguished among clods and stones, we find that, after being for a while under his rule, different portions of it have taken on dissimilar qualities, all strange to the substance as he found it, of which qualities some are transient and some enduring. Here I do not speak on the wider subject, to be touched upon hereafter, of man's power to modify phenomena in general, but upon the narrower one of his power of impressing properties upon matter. Suppose that the substance in question was iron ore. One portion of it man desires to imbue with the properties of a magnet. He does so, and a loadstone it remains; the act of his will ruling it when he is dead and gone, and the one effect he produced upon it becoming a permanent cause to a far extending chain of effects. Another portion of it he galvanizes, and its new properties abide. On another portion he impresses the form of a pillar; and, when he is gone, his idea remains embodied in rigid lines. Some portions he makes pliant as an osier, and elastic as a gas; and when he counts time no longer, these go on aiding in the reckoning of moments. Some part he teaches to float, and it mounts the waves. Some he causes to fly faster than birds, if only for a moment. To take another substance—clay. The sculptor transfers to it his own conceptions, so as to make it represent his ideal of beauty, or force, or mirth, or covetousness, imprinting upon it not only his will, but even fine shadings of his characteristic feeling, unconsciously making it bear evidence of his peculiarities, so that any real critic can tell his hand. And the feats of

the potter in clay are scarcely less wonderful than are those of the sculptor; for while the sculptor, to make his effect permanent, must transfer it into marble, the potter makes a new sort of marble for himself, in which his ideas live when his nation has died, so that when the towers and bulwarks to which he in life looked up with fear are forgotten in dust, his tints, and the transparency he knew how to give, are admired in his fragile ware. Coloring stuffs, again, between the chemist and the painter, undergo incredible transformations by human will, and bear record for ages to its power to make them glow. It is easy for any one to proceed with this series of illustrations, showing how will can give color to the colorless, and whiteness to the colored, opacity to the transparent, and transparency to the opaque, sweetness to the sour, and sourness to the sweet; can make the solid into fluid and *vice versa*, the cold into hot, the still into the moving. Will impresses itself upon the air, and makes it vocal with thought and feeling. Will follows dead matter into living, and makes it change the qualities of organic substances. The flavor of his mutton and beef are in part at the will of the farmer; so are those of his milk and butter; so even are, within a limited range, but a very important one, the forms of his future generations of sheep and cattle. The dispositions and hereditary qualities of dogs, horses, fowls, and so forth, are more or less susceptible of influence from the human will.

At will bodies unknown to nature are formed by man, qualities being developed in compounding which were before unknown. He cannot, indeed, make any original substance. For instance, he cannot make either sulphur or carbon, any more than saltpetre; but out of these three he can make gunpowder, possessed of properties which

they separately had not, and which differently combined they would not develop. Those properties are invisible, and inaccessible also to the other senses. They are known, and knowable by nothing else but by their effects. These properties, however, though insensible, are permanent; and no sane man could say that we know nothing about gunpowder but that it is black, granulated, weighs so much in proportion to bulk, has an acid taste, a bad smell, is opaque, non-sonorous, and composed of such and such proportions of three bodies. Like other things, what is best known about it is its invisible power, which does not, indeed, appear of itself, but is made clearly known by the effects which do appear. Man's power of imparting properties is, in effect, a power of making second causes, for, as we have seen, it is as originating and explaining effects that properties became known.

XIII.

Sometimes we find the power of mind over matter vaunted as if it was unlimited; but it is far otherwise. At every point it is hedged in by fixed barriers, which it can by no means transgress. All action of human will on matter presupposes the existence of matter; which accounts for another fact, viz., that theories of the universe, framed with the design of excluding the recognition of any originating mind, all begin by explicitly or implicitly presupposing the existence of matter, and generally also that of motion. Given these two, their qualities also are given, and thus we are set down in a midst in order to account for a beginning. We are landed far inland in order to let us have a correct view of the ocean shore. The two ruling limitations upon the power of the human will over matter, limitations from which all others flow, are, that it can-

not either produce matter, or confer any of its original qualities.

Creation proper implies distinct powers of conception, production, and formation. By conception, mind presents to itself that which is not present elsewhere, and within itself fashions it to please itself, while as yet the thing fashioned has no body, and no place outside of the ideal world of thought. By production mind calls into being that which had not a being, and which embodies a conception. By formation it moulds that which already exists, so as to make it fulfil a conception.

Now, in man we find two of these powers, with the total absence of the third. Power of conception he has, power of formation he has, power of production he has not, except in the derivative sense of producing new combinations from materials previously existing. He can, after his own limited power, present to his mind, in idea, things which are not, and which never were. He can change them, enlarge them, reduce them, construct and complete them, all in the secret of his soul. He can call these things that are not by names as though they were. But if he calls for them, they do not answer to their names. He has no power to project them forth from his ideal world, and make them take body. He must lay hand on bodies already in being, and form out of them, as far as he is able, what will realize his idea. He must, in familiar phrase, have the raw material. He can ideally cover plains with wheat, pile up wharves with bales of cotton, fill lofts with hanks of golden silk, but make them he cannot. Production generally responds to the conception of means, and formation to the conception of ends. It is as means to ulterior ends that the raw material is wanted, the wheat for flour, and so on. The striking extent to

which man can convert unlikely materials to means for his ends renders us familiar with transformations of matter by mind, familiar with productions which we call creations, with things new and unheard of, with things which wise men of the day before would have deemed impossible. Matter, as the servant and exponent of mind, as its pliant instrument, as the means of embodying its ideas, and of carrying its inward purposes out into external processes, is one of our most ordinary spectacles; and all this prepares us for the conception of matter as the product of mind. If finite mind can produce new forms of it, and imbue it with new qualities, it is natural to conceive of Infinite Mind as producing matter itself, and imbuing it with its original qualities, just as easily as it produces thought.

We have no cases of matter producing new kinds of minds, new attributes of mind, new combinations of mind; and, as a consequence, we have no case of matter employing mind, whose properties it has transformed, as means to its ends. We have accordingly no aptitude for conceiving of mind as the product of matter. But the leap from what can be effected with matter by the mind of a sheep to what can be effected with it by the mind of man, is considerable enough to prepare us for the further bound necessary to conceive of matter as being, in the proper sense, the creature of a mind to which that of man is less than is the mind of a worm to his.

XIV.

The phenomena which represent one will, and only one, are to be observed in every case alluded to in the set of illustrations just indicated. The statue which appears instinct with all the passions of combat and death, neverthe-

less, as we all know, expresses no movement of any will but one; and so on with the rest. Now, every case in which will does impress itself upon matter is one in which the Why carries you farther than the How—a fact which generally holds good when it is a moral agent who is interrogated, and not a physical one. When Bacon spoke of interrogating Nature, he was not imposed upon by his own rhetoric. What he meant was simply making an experiment, using your senses first and your reason next. He never asked flowers to explain their reason for turning dew into nourishment. He knew that to get the Why from a physical agent was impossible; just as it is often impossible to get the How from a moral one. The Why is a question of mind and will, with which the physical agent has nothing to do. The How is a question of method, which to the moral agent is often unknown, even when the Why is plain. How? is a question that keeps within the phenomenon itself. Why? is one that goes behind it. Very often they are confounded.

If we ask, How does the paddle-wheel turn? the proper answer is not, By steam. That is not the kind of way, the how, it turns; it is the cause, the why of its being turned. The question How presupposes the fact of the turning, as already understood. The answer, By steam, goes away back to give an account of its origin. The proper answer is: It turns round, not backward and forward like a door on its hinges. It turns forward, not backward. It turns half speed. It turns at the rate of so many rounds a minute. These are all particulars of its mode, properly included in the How. But with a physical agent the answer to why is always one, "Because it is forced." The paddle-wheel turns for no other reason. In asking why it turns, you go back to a phenomenon lying

behind the first one, the phenomenon, namely, of the forcing of the wheel to turn, and standing within that the How properly comes in again. How is it forced? The axle turns, and makes it turn. Why does the axle turn? Again, because it is forced. How? The crank pushes it. Why does the crank push it? Still, because it is forced. How? The piston-rod pushes it. Why does the piston-rod push? Once more, because it is forced. How? The steam pushes it. Yet another time. Why does the steam push it? Only because it is forced. How is it forced? The fire pushes the water all asunder, and follows up the flying particles, pushing them so violently that they drive all before them.

Do not get tired, but follow the chain through. Why, then, does the fire push the water? Because it is forced. How? The combustion forces up heat and flame. Here you are compelled to change your question. It is now a new case, a case for the question What? Hitherto the mode was all pushing—it was pure mechanics—motion compelling motion; but what is combustion? It is something by which a force different altogether from that of pushing, a chemical force, makes fire seize upon earth, air, and water, and fuse them all into itself—into the force that pushes more mightily than any. Why did the chemical force cause the combustion? Because it was forced. How? The fireman struck a match, which made a flame; he removed the flame from where it was made to where the combustibles were ready, and kept it there till it made them fire up. Why did the fireman strike the match? Because it was his orders—orders—orders! Do you mean he was pushed? No. Do you mean he was forced? No. Did an axle turn, and compel him to turn with it? No. Then, if orders are not force, what are they? If they

don't push, and yet do make things move, what can they be? It was a great break when we passed from the tangible mechanical pushing to that recondite thing called a chemical force. But it seems like a chasm when, from the realm of forces, we have to pass into another region, where that which causes action is not force, but something you call orders; and to think that we have to leap this chasm in tracing a chain so simple as that of the turning of a paddle-wheel! What are orders? Did the fireman give orders to the match? No. Did he apply force? Yes. Then why did he not give orders to the match? and why did he not himself need to be pushed in order to make him act? What can these orders be? Are they animal, vegetable, or mineral? Of which, out of the sixty-five elements whereof all things are composed, do they consist?

Now, if your patience will hold out, I shall try to state the elements of which orders are composed. First, there is a conception of a certain thing as right to be done. Next there is an intention to have it done. After that, there is another conception that the best way of having it done is to order a man to do it; and a second intention, that when the time comes the order shall be given. The first conception and intention fix the end. The second conception and intention fix the means. After this there is an act of will, to the effect that the time being now come, the order shall be sent out. Then the will makes an impression on the brain, it on nerves, they on tongue, teeth, and lips. This causes a thrill in air within the chest and larynx, that on the outer air; and this thrill in the outer air is carried to an ear, which stops the air as a drum-head does a drumstick, but takes up the thrill as the drum takes up a thrill from the stopped drumstick.

This thrill is carried in by a nerve to the brain, and there it wakens up a sense of authority giving commands, and an understanding of the purport of what is commanded.

This may seem a long account of so simple a thing as orders, but there is not an element stated but what enters into their composition. And what you will, perhaps, consider still harder, is that we have only got through the first stage of their journey, the up stage. Hitherto they have been going from the originating authority to the agent; but if they remained within his head nothing would result. Now, therefore, commences the down stage. Once more does will act on brain, and brain on nerves and muscles, then is an arm stretched forth, a match picked out, a box struck, flame elicited, a fire kindled, a ship set in motion.

XV.

Now, the natural question is, In what lies the power of the orders? Whatever that power may or may not lie in, one thing is plain, that from the moment of the first conception within the mind of the officer to that when the fire is actually lighted, the power has to transform itself two or three times. Now do not fancy that these transformations of power are either obscure or tedious to trace. They are plain enough, and soon made out, if only you will keep your eyes open as we proceed. The power at first was power of the mind over its own body. This lasted all the way from the will, through brain, nerve, muscle, and bone, right out to the lips, or for one portion of what we called the up stage, which the orders had to travel. While it was only conception, intention, and will —the things from which, mark, all the rest proceeded—it was invisible force playing in an invisible world, the mind of a man; for no man sees, no man knows, the things of a

man save the spirit of man that is in him. This invisible force began to manifest itself as soon as it began to move the organs of the body. But when it had arrived at the lips, the body came to an end. An inch beyond them the body did not exist, and the mind did not exist. Yet from the lips to the ear of the subordinate there were, say, twenty yards of space. Now, in this gulf, power of a mind over its own body could do nothing. Human will beats in vain against vacuity. What was to be done? Power of mind over body must be transformed into the joint power of mind and body over what is not either of them, over what can neither feel nor grow, can neither listen nor speak, can neither inquire nor reply; and the power so transformed must make this inanimate air take on the impress of the will, and convey its determination across that channel of separation. So, the power becomes power of mind and body together over external nature, and in this new form it projects the fiat of the will, not only outside of the mind, but also outside of the body; so that the man's thought shall act where the man is not. We might say that this sounds like requiring impossibilities. Nevertheless, that something which the mind, through the body, does to the air, writes upon it, in lines which neither the mind nor the eye can trace, the words selected by the will. It does more, it makes it represent not only the words, but the amount of earnestness with which the mind regards their import. All this it causes the air to carry for it across the chasm of twenty yards, just as a postman might carry a letter across a street, or a little boat carry one across a stream; and so the air, knocking at the door of the man's ear, delivers the captain's message in words, and his feelings in tones.

At this point takes place a third transformation. The

"orders" first left behind them both the body and mind of the captain, and now they leave behind them the external air. They again enter upon an invisible world, that of another man's inner being. The power has now to change from that of man over external nature to that of external nature over man. This power makes nerve and brain thrill, and enables the will of the captain to rouse the mind of the subordinate, and to move his will. Here is actually a fourth transformation. The power becomes the power of one will over another. In the previous stages there was only one will at work, now will is moving will. Again re-appears the original form of the power, that of the mind over the body. So the match is soon in the hand; for the matchbox was at its post as well as the fireman. But now we come to another break. Suppose that the fireman said to his match, It is four o'clock, and the orders are that you strike fire! What would happen? The match would make no objection, but nothing would be done. Suppose he added, I am on duty, and have full authority! Still no objection on the part of the match, but nothing done. Suppose he said, They are the orders of the chief-engineer! just the same. "They are the orders of the captain!" always the same. "Don't you know this is the flag-ship? the admiral is on board; they are his orders." No matter. Even if he alleges the authority of the First Lord of the Admiralty, ay, that of the Queen, he effects nothing. The lucifer-match cares no more for the authority of the Queen of England than for that of the youngest cabin-boy. By its own speechless action it says, I dwell over the border. On my ground decrees issued by authority do not run. Only force is power here. So, once more, the power, putting off the noble form of authority in which it had

swayed the man, has to put on the rude form of mechanical force. By one stroke of such force the man causes friction, the friction awakes a sleeping chemical power, and this results in a flame. Suppose that a second time the man fell back upon authority, and told the flame that the orders were that it was to kindle the fire, it would be with the same result as before. He must convey the flame from the point at which the match was when he struck it to the point where the fuel is awaiting it; and he must use force enough to do that.

Now, why was it that the fireman did not require a crank or a piston-rod to push him, and force him to act? Why was it that he would have resented that form of power, but kindly welcomed the command of a duly authorized will? It was because it was his nature. He was born so; born not to be a tool, but a workman; born so that, when co-operating with tools, his place was to be the master; and when co-operating with men, even with the mightiest in mind, body, or estate, his place was to be not that of a mere tool, but that of a fellow-worker; so that the movements of his limbs should not be mere movements of a machine, but conscious actions of a mind, and conscious response of will to will. And why was it that authority would take no effect on the match or the flame, or, indeed, for that matter, on fire, water, piston, crank, or wheel? Why must force be used to move them to anything? Because it was their nature. They were made so; made not to be workmen but tools; made so that when co-operating with other tools their place was to be driven to the work; and when co-operating with men, even the humblest, their place still was to be driven to it. Their appointed office is to display the power of one will over many forces, and over movements without number—the

power of will to impel that which cannot appreciate its force, and to guide that which cannot learn its reasons.

The inventor had put into the match much knowledge of things vegetable and things mineral — of laws of elements, laws of compounds, laws of friction, of explosion, of combustion, and so forth; but one thing he had not put into it, and left ready to be brought out by a touch, and that was the power to recognize authority and act upon it without waiting for force. The power of the captain could do much with his subordinate; but one thing he could not do, and that was to make him prefer being driven by force to being led by lawful authority. The realm in which will rules over material forces is widely separated from that in which will rules over will. And this bears upon the different modes in which the two orders of laws respectively are imposed upon their own agents.

XVI.

The manner in which the two orders of law differ in respect of their operative powers has been already indicated; physical law being sustained by irresistible force, moral law by supreme authority. While physical law cannot be broken by either physical or moral agent, and while moral law cannot be broken by physical agents, though it can be broken by moral ones, neither of the two, it will be remembered, can be annulled. The one order operates by simple force of a supreme will; the other, though upheld in authority by that supreme will, operates through subordinate wills, influenced by conscience of right and wrong, and by expectation of reward and punishment.

Here is the place to note the habit of speaking of violations of physical law. Such language is always mislead-

ing, and is often a mere device to confound physics and morals. No man knows how to begin to break a physical law. What are called violations of physical laws, such as sailing in a crazy ship, or eating unwholesome food, or breathing foul air, are really violations of no physical law, but only of the moral precept, Do thyself no harm. The physical laws reign unbroken over the passengers in the crazy ship as well as in the sea-worthy one. So they do over the man who eats what he knows does him harm, and also over him who lets his air become deadly. You may be heedless of physical laws; you may neglect to conform your action to the dictates of wisdom deduced from their known course; you may even set yourself, yea, dash yourself against a physical law; but if you do so, it is not you that will break the law, but the law that will break you. It will quietly maintain its dominion and hold on its course, whether over your corpse or over your living frame. A person who throws himself over a precipice is as perfectly under command of the law of gravitation as one who lies on a sofa. The man is broken, but the law was never for a moment deprived of its control. The cannon-ball, when flying in the air, is under the inviolable law as completely as it was when lying on the ground. So it is all round the circle. Exhortations to learn the lessons pointed out by physical law become more impressive from the fact that it is by a mere figure of speech, and a bad one, that we ever talk of violating them. The plain phrase, "running contrary to nature," has in it more both of science and philosophy than pretentious speeches about violation of the laws of nature. We may run contrary to nature, and in so doing we violate moral law, and incur moral guilt; but it is the guilt of defying almighty force, and not the guilt of frustrating beneficent physical law. Will can dash

against physical law, but it fares like a blinded bird dashing against granite.

XVII.

The kindred phrase, "modifying" laws of nature, is also, as we said at the beginning, incorrect. We can no more modify any one law of nature than a policeman can modify one of the statutes. What is meant is this: that we can move laws in such a manner as to modify the effects which would have arisen under some one or more of them had we not moved at all. For instance, if gravitation presses a certain quantity of gas together with the force of a pound weight, and at a temperature of fifty degrees keeps it within the compass of a bushel, the law is that at fifty Fahrenheit that weight of gas shall not occupy more than a bushel of room. But if we raise the temperature to seventy, the law is neither broken nor altered when the gas expands and its volume will not stay within the bushel. The law would be broken if it did so. The volume will always be in inverse ratio to the pressure, the temperature being the same. No change of temperature, no change of volume, no change of pressure alters the proportion. That is law, and a law of the order in which the laws fulfil themselves, admitting of no modification.

Another expression, which more nearly meets the facts, is "playing off one law against another." In the case just referred to we see the two most conspicuous of physical laws set in opposition. Gravitation, the compressing law, thrusts the gas together. Heat, the expanding law, dilates it. Increase the pressure without increasing the heat, and closer goes the gas together. On the other hand, increase the heat without increasing the pressure, and wider goes the gas asunder. If you want to overcome compression, put on more heat. If you want to overcome expan-

sion, put on more pressure. A case like this shows how the word law is really used for a force. And what we call playing off one law against another is setting one force to operate against another. If, as in the case in hand, there is a clearly ascertained rule of proportion between the effects of two forces, then our setting of them to counteract one another ceases to be empirical, and becomes regular.

When we come to look at our power of modifying phenomena, it will appear how greatly the ideas of violating physical law and modifying it are abused for the purpose of luring people from faith in Providence and in prayer.

The operative power of the two orders of law respectively naturally differs in its modes of taking effect. Physical law, not involving the possibility of any conflict of wills, works itself. It is, and it rules. It is backed by irresistible force. Moral law, on the other hand, assumes the existence of this lower order of rule over unconscious agents, and also assumes, on the part of the higher order of agents to whom it is addressed, a power so to set in motion physical agents as to do wrong and bring about harm; a power so to manipulate the laws ruling those inferior agents as to produce effects which could never have arisen from any action of the agents themselves, moved only by their own forces, and left alone to the guidance of their own laws. It assumes, further, the presence in the agents addressed of the consciousness that there exists a relation higher than any conceivable physical one—a relation between intelligent being and intelligent being, between debtor and benefactor, between dependent and sustainer, between lower mind

and higher, lower knowledge and higher, lower justice and higher, lower goodness and higher, lower power and higher —the relation, in fine, between a rational being and the Author of his being. This consciousness necessarily carries with it a sense that the rights of such Author, Sustainer, Benefactor, and Superior are supreme above all other rights of self or fellow-creature. Moral law rests upon this sense of the rights of God; of rights over us which were acquired ere we began to be, and were founded in irremovable relations and benefactions without number, ere we had a thought. But moral law at once extends to the rights of our fellows the shield of the rights of God. Their rights, indeed, come in a secondary rank, but they cannot be dealt with apart from His. We are not left to harm our fellow-creatures, and then to stand alone before the tribunal of the brother wronged. We cannot wrong man without in the same act striking against the authority of God. We cannot wrong the offspring without insulting the Father. We cannot benefit the offspring without the Father saying, Well done! Thus are the moral sense of right to a brother, and that of right to a father bound up together, and to this sense does moral law appeal.

Granted, then, our power of acting; granted our power to sway physical agents; granted that we can, if so determined, do this in a wrongful way as well as in a rightful one; granted that we can, if so determined, ruin a brother or render useless some valuable gift of Providence, the appeal of moral law is to our sense of right and wrong, to our sense of justice to God and man, to our conscience. We are called to use our power in a manner worthy of His offspring, and well-pleasing to the giver of all powers. If, in response to this appeal, right is done, the deed, while keeping unconscious agents in useful action, elevates the

moral agent who does it, benefits another moral agent to whom it is done, and holds both in good relation with the common author of their being. The other pole of this sense of right is the sense of wrong; a mysterious might, which hovers on the frontiers of innocence and guilt, driving the will away from the one ground as vigorously as the sense of right leads it towards the other. The manifest vileness of doing wrong in one act, both to fellow-creature and Creator, wounding the former in his interests, feelings, and joys—wounding the latter in His authority, and in his love to His offspring—this is the inner force that propels backward from the evil deed in correspondence with the sense of right, which invites forward to the just one.

Such motives do not involve merely a judicial sense of rights and wrongs apart from feelings founded in our natural relations to our Creator on the one part and to our fellow-creatures on the other. It is the intense feeling of our relation to God as the Father, Life, and Joy of our existence, and of relation to men as being to Him all that we can be, and as one with us in nature and equal in rights, which gives to the sense of right and wrong a warm vital force, carrying the appeal made to it by law through our whole being, as a current flowing from the springs of nature, and bearing life with it where it comes.

After our sense of right and our sentiment of natural relation, moral law appeals to our individual love of self. It offers us rewards for obedience, it threatens us with punishment for disobedience. Here at last comes in force, under the reign of moral law; force not to necessitate the action of the agent, but to uphold the authority of the law-giver if it is defied. This appeal to the love of hap-

piness and the fear of misery is sometimes called a selfish motive, but incorrectly so. What would a town be if populated by inhabitants without any love of happiness or fear of misery? It would be a foul den of sloths. What do men who are heedless of their own welfare ever do for others? The men of self-sacrifice are they whose sense of joy and sorrow is acute, but whose ideal of happiness is higher than self-indulgence. And to be in a position to offer self-sacrifice, you must not be one of those for whom other people have to do everything.

What is really selfish is anything that stands in the way of the welfare of others. Nothing does that more effectually than want of determination to provide for one's self. After our love to God, which covers and hallows all other legitimate love, comes our love to self as the standard of our love to our neighbor. The law is not love thyself as thy neighbor, for that would be far too low a standard. The law is love thy neighbor as thyself. The first great service to be done by any one to his family, to neighbors, to mankind, is to do well for himself, in God's glorious sense of doing well. If he has his own heart and principles, his own loves and antipathies, his own comrades and pleasures, his own habits and labors all adjusted to the scale that shall be truly well, that shall be best for him, then will his burdens never press on another man's shoulder, while his shoulder will ease the burdens of many another. The "well-doing" man is a strength to parents, relations, and all who have dealings with him. The "never-do-well," in neglecting himself, entails disgrace and misery upon others. He that is himself happy makes others happy, and he that is wretched makes others wretched too. He that succeeds, lifts others up; he that fails, brings others down.

The feeling, I should degrade myself; I should defile myself; is the spring of moral repulsion from evil, which in point of force comes next to the feeling, I should offend God. But the measure of this force depends on the ideas that hang around the "I myself." If the "I" is the son of nobody, the feeling is one; if he is the son of a glorious Parent, never absent or asleep, it is another.

Men can easily go down below the level of dreading to make others wretched. It is not so easy to get below the level of dreading wretchedness for one's self. Callous crime may come down even so low, but perhaps not till despair has set in. Fear is the necessary counterpart of hope, and shares with it the common office of asserting the ascendency of motives derived from the future, and of rendering conduct more a matter of reason than of appetite and impulse. Both link in human feelings into the chain of past, present, and future with which the human lot never ceases to be connected. It is easy to call fear a base passion, as if all fears were so indiscriminately. Fears there are that are base, but so are there loves that are base, and even hopes that are grovelling. But who would say that the fear of missing an attainable good was a base feeling, any more than its counterpart the desire to secure that good? Yet fear of missing a good is only one form of fearing an evil. Fear of doing wrong, fear of incurring just blame, fear of bringing upon one's self dishonor, fear of offending benefactors, fear of causing merited displeasure, fear of occasioning ruin, fear of wounding one's self, poisoning one's self, drowning one's self, and such like, are cases in which it is idle to call fear base. Probably what is meant is, that if a man is so overcome by consternation as not to be capable of firm action, or is so influenced by fear as to do what is wrong, that is base.

Certainly; but similar cases of hope and love might be cited.

Whether we conclude or not that fear ought to have been left out of the constitution of creatures, and pain out of the system of the universe, the fact for practical men is that it has not been so done in either case. Pain is a tremendous reality. Loss of possible good is one of its most familiar causes. Fear is as much the fitting emotion to be correlated to this state of facts as is hope to be that correlated to the possibility of attaining future good. The habit of confounding pain with evil easily leads to confounding pain with wrong, if not expressly, at least implicitly. Much lamentation over pain is coupled with extenuation of wrong, as if the evil was not so much the wrong as the pain, and as if the system of the universe would be greatly relieved of loads were wrong only freed from the attendant dread of pain. But no one has yet shown how wrong can be freed from the tendency to inflict pains on the party wronged. Pains entailed upon the faultless are one of the ineluctable effects of wrong done, and pains imposed upon the doer of wrong are not an evil, but a good; and a good altogether needful to government by free agency, by command and prohibition, by reward and punishment. Had all government extended only to machines—had all been kept within the realm of weights, measures, forces, and mere movements—pains might never have entered; but where would enjoyments have been? Wrong having been permitted, the first stroke of it, as between fellow-creatures, inflicted pains on the innocent. Were these to be the sole pains? Were none to overtake the guilty? and when they did so, were not they and the fear of them a part of the moral forces tending to check wrong, to encourage right, and so to defend all of happi-

ness that remained? As in flying in the face of physical law man, though he cannot break the law, may break himself against it, so in flying in the face of moral law, though he may, indeed, break the law, the law in turn will break him.

Among Atheists the credit belongs to the Comtists of making a serious attempt to commend morality, and to connect it with their system. That attempt yields strong proof of the practical force of Christian law, while their mode of making a new basis for moral obligations yields equally strong proof of the necessity for seeking the basis in the rock, Our Father which art in heaven. To replace belief in God, as the natural and logical groundwork of all sense of rights and duties, Comte presents the idea of Humanity. This is carefully explained not to mean beings, but existence; not individual men in the concrete, which is too low a conception, but Humanity in the abstract. What, then, is Humanity? Comte, says Dr. Robinet, finally defined it, *The continuous sum total of convergent beings.** Not, I repeat, the beings, but the sum total of them. Now do not take my word for it when I call this sum total an abstraction.

Comte looks at it in this light: "For the Positive mind (or mode of thought)† man, properly speaking, does not exist; nothing can exist but humanity;" and the reason for this conclusion is, "because all our development is due to society, in whatever point of view we regard it. If the idea of society still appears to be an abstraction of our

* I do not just now remember where in Comte's many volumes this occurs, and Dr. Robinet does not give the reference.—*Ouvre*, D'Auguste Comte, p. 33.

† The word is *Esprit* Positif.

understanding, that arises from the power of the ancient philosophic regime; for, to speak the truth, it is to the idea of the *individual* that such a character pertains, at least in our species."* The individual then, if the truth is told, is an abstraction, and man, properly so called, does not exist. But the concrete society, or Humanity, or the continuous sum total of convergent beings, is to replace men at one end of the line and God at the other. Now, if this is a jumble of terms and thoughts, there is method in it. The individual is to be annihilated in order to cut up by the roots any idea of a future life. On the next page following the last quotation this "thinker" goes on to say that the tendency of men to eternize themselves, which formerly sought satisfaction in illusions incompatible henceforth with our mental evolution, will find its satisfaction in collective Humanity. "The individual not being any longer able to prolong himself except through the species, will be drawn to incorporate himself with it as completely as possible."

This is the Comtist substitute for the law, "Thou shalt love the Lord thy God with all thy heart, and thy neighbor as thyself." First, you have no God to love you, or any other man; and therefore you have no God to love. All such ideas are illusions, theological conceptions. Secondly, neither men as actual beings, nor Humanity as an abstract total, had any Father. Men are others, but not brothers; not offspring of a common parent; all your good feeling towards them is only "otherism" or "altruism," not brotherly love; and if you do call them brethren, it is in defiance of the fact that there is not a common father. You are greatly to respect yourself. But you yourself are only

* "L'Esprit Positif," p. 74; see also "Philosophie Positive," vi. 692.

an individual—that is, an abstraction. You are greatly to respect yourself; but if I secretly murder you there is no Father that respects you, or makes inquisition. For the Christian motive of high birth and divine parentage, you are reduced to no parentage at all, except that of unconscious force. For the Christian motive of infinite individual worth, you are reduced to individual vaporization. And you are to look to Humanity as your Providence, and to respect yourself and others. The self-respect due to the offspring of God, and to a soul that outweighs a world, is to be replaced by the self-respect due to an infinitesimal particle of the continuous sum total of convergent beings, and to a soul that has no future life, except as others remember you. The description given by the master himself of the ideal fabric that is to rise on this wonderful foundation is not unfitting. He describes "the principal conception of Positivism" as consisting in this: "Man thinking under the inspiration of woman, that synthesis and sympathy may be made to concur, in order to regulate synergy."*

The two orders of law, then, have been shown to differ in the agents ruled by each respectively; physical laws ruling unconscious agents, moral laws ruling conscious and responsible agents. They have been shown to differ in the kinds of relations established under each order respectively: the relations of the unconscious agents being invariable at every time, and as between every pair of correlates corresponding strictly to the law; but the relations of the responsible agents being not invariable, but normal; liable to be out of accordance with the law, and

* "Catéchisme Positiviste," 2d ed., p. 24.

in defiance of it, yet happy only when in accordance with it. They have also been shown to differ in the manner in which each respectively takes effect; the relations of unconscious agents being imposed by force impressed upon the qualities of the agents themselves, and altogether irresistible, and the relations of the responsible agents being imposed by supreme authority, expressed in command and prohibition, with annexed promise of reward and threat of punishment, appealing to such properties in man as conscience of right and wrong, feelings of what are natural ties, and hopes of good coupled with fears of evil. As in the physical world the compressive force, gravitation, and the expansive one, heat, are forces under which all others play, themselves being held in balance by an unseen unifying Power, so in the moral world do the repressive force, fear of evil, and the animating force, hope of good, preside over the action of all feelings and passions, themselves being held together by one Living Centre of all Power, inspiring awe, and of all Fulness, stimulating eternal hope. And as in the physical realm the eye, the great revealer, confronts world with world, being with being, and instrument with agent, and does it by receiving light from on high, so in the moral world does the conscience of right and wrong confront father with offspring, and brother with brother, and does it by receiving the revealing beams of the Spirit of God, the light on His part of goodness, while for us it is the light of life. Of this conscience of right and wrong the sense of rightful authority and that of duty are both forms.

It remains for us now, in the two remaining sections, to see, in the first place, how the combined operation of the two orders of law, resulting as it does in a system of free agents and fixed instruments, devolves upon the free agents

the power to modify phenomena, even by virtue of inflexible laws; and, in the second place, to see what are the necessary antecedents fairly presupposed by the existence of the two orders of law, and by their co-ordination into one operative system.

PART V.

THE COMBINED OPERATION OF THE TWO ORDERS OF LAW, RESULTING IN A SYSTEM OF FREE AGENTS AND FIXED INSTRUMENTS, DEVOLVES UPON THE FREE AGENTS CERTAIN POWERS OF MODIFYING PHENOMENA, EVEN BY VIRTUE OF THE INFLEXIBILITY OF PHYSICAL LAW.

However incorrect it may be to extend to all phenomena whatever the uniformity which exists among phenomena only so long as they are left to the mere operation of physical law, we are not at liberty to overlook it in the sphere where it holds good. That sphere extends wherever vital agents do not act. Where no conscience asks what is right, where no judgment weighs the expediency of one course against that of another, where no choice selects, where no will moves, there does the silent stream of sequence flow absolutely equable, and he who knows its law is able to foretell its future course. But we shall see that no such uniformity can be reckoned upon wherever these elements enter into the combination, or even where a force of a lower order than these enters in, namely, that of vegetable life.

I.

In a former section it was said that a physical law might rule in the sun—an asteroid, a comet, open space, or

granite. Now in the first four out of these five spheres, it would be safe to reckon on the absence of any interference by volitions. Hence it would be safe to predict, and it is natural to wish that we could do the same in all cases. But whether similar fixity is to be found in such a sphere as ours is not a point to be decided by wishes, or even by analogies. One thing is obvious, that if such few phenomena of any heavenly body as come over the distance to present themselves to us are uniform, they are only those which occur in the absence not merely of voluntary finite agents, but also in that of animal or vegetable forces.

If one learned in the stars is asked, Where will such a heavenly body be this day ten years, and whither will it be going? he has no difficulty about the answer. But if one learned in granite is asked, Where will this block be this day ten years, and what will it be doing? he is not so sure. Why not? Can he not compute the operation of physical laws, from that of gravitation up to the friction of winds? Even if he can, is that all? Does he not find that the adamantine strength of granite comes within reach of the more subtle force of will? The simple fact is, that there is no telling what the block may be ten years hence. You may magisterially tell a true man of science that prediction is the business of science. He knows that there is a higher business than that, which is to tell the truth; and where the truth is that he cannot predict, true science commands him to say so.

But as to the block of granite, it is not in the safe-keeping of mere physical laws. The will of an engineer may interfere, and turn it into the key-stone of an arch. The will of a rich man may interfere, and turn it into a column in his hall. The will of a church-warden may in-

terfere, and turn it into a font. The will of a corporation may interfere, and turn it into pavement; so that ten years hence the greater part of the block may have been converted into street mud, and what remains of it may be daily trodden underfoot of birds, beasts, and men, each of whom at his own weak will shall modify its phenomena.

It is not unusual to speak only of unconscious agents as being natural ones, and also to speak only of physical law as being natural law. But the birds, beasts, and men are all as much a part of nature as the stone; and the law that stone should be liable to be broken or trodden by them is quite as much a law of nature as that granite should lie lower down than sandstone. But if birds, beasts, and men are natural agents, then is the talk about the invariability in action of natural agents utterly unscientific. All that is meant is agents composed of inorganic matter; for it will soon appear that the vegetable world, as well as higher ones, is forgotten in such hasty generalizations. However, neither bird nor beast, any more than man, belongs to that order of agents whose phenomena evolve themselves with the inflexible order of physical law, uncheckered by any volitions. They are agents, the very nature of which is such that wherever they become factors in any process, the sure, silent course of physical sequence is at an end, the day of certain prediction is closed, the sluice is opened for probabilities, and bodies without life stand face to face with more than one order of agents, as natural as themselves, each order obeying a group of laws special to itself—laws independent of purely physical ones, totally "inaccessible" to all physical agents, or, if you please, "unknowable" to them; and, moreover, laws that entitle and empower these orders, each in its own degree, to interfere, according to an ascending

scale, with the operation of mere physical law, and by so doing to modify phenomena. Instead of the fact being that phenomena cannot be interfered with by wills, that assertion is in an intellectual point of view unworthy of notice, and is entitled to a moment's attention merely on the ground of the moral mischief it is employed to effect. The obvious truth is that the chain of events, as it would evolve itself in the absence of wills, is liable to be interfered with, and as a matter of fact is interfered with, by any will and every will of which experience has yielded us any knowledge, from the narrowly restricted will of the worm up to the immeasurably freer and more potent, but still greatly restricted, will of man.

II.

In fact, the invariable uniformity of phenomena ceases before you rise so high in the scale of creation as the worm. The boundary-line between "uniformities" and variables in phenomena is drawn at the point where vegetable life begins. Dead certainty is known to us only for dead things. Vegetable life, which lies between the sphere of will and that of lifeless movements, everywhere asserts its own limited power to interfere with the course of sequences as they would run on in its absence. Where no vegetable life comes, you may foretell the future of the earth or stones. But once a plant comes within reach of these, their future depends in some measure upon its future. If it thrives, their condition will be one; if it dies, another. The course of phenomena within the body of the plant itself is not to be foretold with the certainty of the mechanist or chemist. Will it bear fruit? That may depend on a wind, a frost, a child, an insect, a gardener. Will the fruit be sweet, or only half ripened? That must

depend on the balance held between the action of this world and a distant one; for it is not at the fires of earth that the plant spreads out its hands for warmth. All life sits to warm itself at the fireside of heaven. And if earth and heaven do not work together on behalf of the plant, its fruit will never make glad the heart of man.

But one feature in the case of the plant is that it holds not its lot in its own hands. It is largely dependent on higher powers, powers to it invisible, unknowable, inaccessible, inscrutable, incomprehensible. There are beings of the earth, beings of the water, beings of the air, possessing inconceivable attributes — inconceivable to plants — attributes called sight, locomotion, scent, and such like, and even some transcendental refinements of the inconceivable, called thought and will. Such mysterious invisibles rise up in awful ranks of ascending principality and power, till the throne is reached of one so mighty and so dread that he can cut plants down or set them up at will; can refresh the languid, can support the feeble, can consume the barren, can train up the good, can nurse the exotic and extirpate the native, can sweep to destruction entire forests, and cover a country-side with new growths.

Not only has this terrific power forces within his own person, but beyond himself he casts abroad a mysterious shadow of command. Metals, stones, rivers, flames wait upon his will, and are turned by it in favor of a plant or against it — till, were the plant endowed with reason, it might well seem to it as if the so-called laws of nature were only ready agents of this high and mighty master. Furthermore, he commands also beings as invisible to plants as himself, and like him possessing supernatural attributes—of course we mean supernatural not to themselves, but to plants — such as eyesight, locomotion, and

ability to devour things. At will he makes troops of these powerful vassals tread plants down, or eat them up, or yield them fertilizing nutriment. Both gentle birds and mammoth elephants do his behests. The plants might say that, so far as they are concerned, the course of law seems to be quite at the "caprice" of this tremendous power.

A deeper depth in this mystery still remains. It would appear that the powers of this strange potentate extend even to the holding of commerce with other worlds, and that aid and comfort is drawn by him from such worlds, in the war he is evermore waging with vegetable and mineral nature. It is certain that pet plants of his are indulged with special provisions of light and heat, sent to him from the distant world called the sun, and by him stored and utilized so as to keep his *protégés* warm and flourishing, while other plants and older inhabitants are pinched with cold, sometimes even to death. And very strange it is that this commerce with the agents of other worlds is maintained by means of his power over stones; as if the extremes of widest improbability were to come bowing down to his dominion. What he calls glass is somehow conjured by him out of sand, which is nothing more or less than finely broken stones. So that giving to this dust of dead rocks an incredible resurrection body, by some totally inscrutable interference with its due course of phenomena, he makes the raised-up particles into ministers of light, and workers together with the sun.

Now these are things which to any plant lie so far beyond the sphere of observation, though held to be within that of inference and belief, that, were the faculty sometimes dignified with the name of reason once to gain an entrance, the grave question might be raised in the vege-

table kingdom, whether the extreme improbability that any ruler should be possessed of those unaccountable powers of interfering with the laws of nature, and of disturbing the proper flow of phenomena, does not cast serious doubt upon the existence of any such being as man.

III.

If I may be permitted to suppose myself an agnostic oak, I should reason thus: That alleged being, man, has never come within range of my perception, nor of that of my preceding generations of noble trees. He is not known. He is invisible, inaccessible, and everything that is negative. His existence, then, is not to be admitted; indeed, it is a supposition too airy to be even denied. Who troubles himself with proving negatives? It is known that laws of phenomena cannot be interfered with by any volitions natural or supernatural. All volitions would be supernatural which should be above the nature of plants, were any such volitions admissible. The legendary powers ascribed to man, and in particular his alleged power over the inner life, the very juices and tissues of plants, power operating, according to hypothesis, in part by force of his own will and in part by help of agents from the heavens, involve the idea that he has under his command whole groups of the laws of phenomena. But this cannot be. So he is not a reality; only a theological fiction, belief in which was excusable in the infancy of the vegetable kingdom, and even had its uses then, but is to be laid aside now as unworthy of fully evolved wooden-headedness.

Still, supposing myself this venerable agnostic oak, I should go on to reason thus: All conceptions of the vegetable mind pass through three stages of development. These

three successive stages — that is, successive and simultaneous, as the learned would hold — are respectively the zoological, the meteorological, and the botanical. In the first, or zoological stage, the belief was that vegetable conditions were ruled by animated beings; in other words, by supernatural beings. Phenomena were accounted for by the action of these. If flowers were fertilized by the pollen of one plant being carried over empty space to another, it was said that the Zoa, or gods of that plant world, did it. If roots were fattened by fertilizing deposits, again it was the Zoa that did it. If the nature of fruit was changed by transfer of a branch to another stem, still it was the Zoa that did it; and so the crude notions of those undeveloped generations ran on, ever imagining superior powers as causes of natural phenomena.

In the second stage, plants ceased to account in this manner for phenomena, and assigned them to meteorological causes. They would have it that existence depended on unseen powers, but not capricious powers with wills, like the Zoa; more rational powers, powers without minds or wills, like good clay or stones; such powers as air, water, heat, lightning, and such like. The plant mind in that stage transferred the fate of its future from the Zoa to the Meteora. It was but a transition stage. It held that the Meteora, vulgarly called the elements, ruled most things. But, emancipated from this stage, as from the preceding one, finally the mature intellect flowered into the botanic stage. In this stage all mysteries fell away. Origins and processes both come out into plainest evidence. All things were explicable, and were explained. Vegetable life, it was now recognized, came of matter taking the globular cell form, which globular cell form contained within itself a perfect equilibrium of all the con-

stituent elements, and, furthermore, contained all the infinitely pregnant possibilities of growth. Growth made all things manifest, reduced all phenomena to the intelligible category of natural processes. Growth accounted for circulation of juices, for reticulation of veins, for respiratory action, for absorption and exhalation, for efflorescence, for semination, for synthetic synergy of organ and environment, for co-ordinate efficiency of organ and function, for epigenitic progress from germ to organ, and for carpogenethlic synkinesis of the sexes, with other phenomena of the botanic hierarchy.

I assume that, as a plant, my modes of reasoning would be changed. And, getting up into the elevated regions of the ultimate stage, naturally the infusion of Latin and Greek in my English would be strong — eventually so strong that, power to dissolve it ceasing, saturation would ensue.

Returning from vegetable reason to human, my simple view is this, that reasoning which proceeds on the principle of beginning in the middle, and refusing to look at either end, emitting much gas of dead tongues by way of light, is not manly argument. It passes for much with those who are not overtrained either in the use of tongues other than their own, or in the rules of reasoning. It passes like smoke over those who are, unless when the point argued for is to their liking.

IV.

We may now turn from the manner in which phenomena within the vegetable kingdom are liable to be modified by animals and human beings, to the other side of the question, viz., the manner in which phenomena in other realms of nature are liable to be modified by vegetables themselves. They modify the amount of light which may

fall on a given surface of ground. They modify the quantity of heat to be there felt. They modify the quality of the air. They modify that of the water. They modify the rainfall and the currents of wind. They modify the condition of all animals. They profoundly modify that of man, yielding to him food and medicine, and also poison. They form a large portion of his clothing, from the mat garments of the South Seas to the fine linen and muslin of the Court. They build up the home of man, at least in part, very often altogether, as in wigwam, log-hut, cabin, and many a goodly homestead. Outside of these spheres of rigid use they offer to art noble hints, glorious forms, and objects of never-ceasing freshness, always rising in beauty as the mind itself rises in capability of feeling the beautiful.

It is quite correct to say that no modifications in phenomena are effected by plants but such as we could foretell did we know all the preceding conditions. But that is one of the sayings which, when new to one, seems to signify something considerable, but when it has hung before your eye for years, loses its appearance of importance. It amounts to this, that if we knew the causes which would be in operation at any given moment, we should know the effects to be looked for in the next. Here I may say in passing that, of course, I do not accept the shuffle of calling conditions causes. They may be, and generally are, no such thing. But it is certain that, in respect of plants, we do not foresee all the conditions for a single month of any grove, or strawberry-bed, or timber-yard, or shoal of sea-weed. Much less do we foresee the agency which may come into action, and may turn existing conditions into facilities for causing in one case this effect, and in another case an effect diametrically opposite. Such

agencies may include physical forces like winds, temperature, floods, or prairie fires. They may include animal forces, from insects up to hounds and hunters. They may include human forces armed with the axe, the plough, and a thousand other auxiliaries. Now, when in reference to so large a portion as this is of the domain of nature either Mr. Mill or any one else speaks of the abstract possibility of unerring prediction, it is preferring to fly in regions where systems ought to have been made, rather than treading the firm ground where the system that has been made can be observed.

The clear result of all observation is, that from the point where begins the interaction of lifeless agents and of bodies possessing even vegetable life, there ceases our ability to foretell with rigid physical certainty. In fact, uniformity, such as would enable us to predict, ceases when we touch the running water and the floating air. Where to a mind above ours all may be moving in steady marches, step by step unswerving, to us contingencies tremble in every cloud and whisper in every breeze.

V.

We have only to rise from weather and plants into the ranks of insect life in order to feel that when men speak largely of the uniformity of phenomena, and of ability of prediction, they are mistaking the constancy of physical agents for the uniformity of phenomena. The insects, though feeble folk, tell us all that it is one thing to know what will be done by bodies without life, whether elements or compounds, whether particles or masses, when left alone to their own laws, and another thing to know what will be done by the same bodies when those laws are set in motion by animated agents.

One who could easily calculate with what illuminating power the rays of the sun will fall at noon to-morrow on a certain plain of Arabia, knows that the actual sunfall will depend on whether the locusts come or do not come across the sky. Should they come, the phenomena will be modified. Yet this is perfectly in the course of nature — an inconsiderable insect is allowed to interfere between the heaven and the earth.

To come to Europe, the plains of Languedoc to-day show many a district where year by year the vintage was wont to fill homesteads with abundance; but now the time of vintage is the time of lamenting. Sun, winds, rain, earth, all the same; man more skilled and more eager than ever; everything to promise annually increasing yield, if no unknown agent had appeared on the field. But the unknown agent did appear, rendering the best of human foresight vain; and many a flourishing farmer was turned into a wanderer in search of bread.

To come still nearer home. In Ireland an insect, unknown to experience as a power affecting either chemical or mechanical phenomena, never thought of in connection with phenomena in the sphere of commerce, politics, or medical science, comes upon the scene, and lo! in all these spheres and others modifications of phenomena tread upon one another's heels in a fashion that resounds very far. Phenomena in crops, phenomena in the aspect of the country, phenomena in the infected air, phenomena of ships coming and going, phenomena in markets, committee-rooms, hospitals, phenomena in ten thousand heartaches, phenomena in desolate homes, in funeral bells, in graveyards—all these rushed upon mankind modified beyond every power of calculation. This arose, not from any violation of physical laws, but because those laws had been

set in motion by an agent whose methods and forces had previously been unknown factors in national affairs.

VI.

Any one who chooses to trace the methods wherein phenomena are modified by various grades of agency, from insects up to man, will come upon the oft-repeated fact, that while in each new order the agent modifies them in ways of its own, and while we can tell with some confidence what effects it will produce if left alone, it by no means follows that it will produce the same effects if interfered with by other agents. Beginning lower down than insects; it is one thing what clay will do if no seed comes near it, and another thing what it will do if grass seed is strewn upon it. What grass will do if no animals come near it is one thing, what it will do if geese crop it is another, what if sheep crop it another still, and what if horses crop it yet a different one. What the pollen of a flower will do if let alone is one thing, what if insects carry it about another. What a flock of sheep will do if left alone is one thing, what it will do under care of a shepherd's dog another.

All through nature, from the lowest levels to the highest, runs a chain of co-ordination, an agent fitting into its place, under those of one class and over those of another, and all, whether subordinate or superior, co-operating as portions of an ordered system, complex, and yet bearing one common character. This subordination of one agent to another affects the question of uniformity of phenomena, and multiplies the contingencies as to what agency may turn mere conditions into accessary causes, every separate agency affecting the result in ways peculiar to itself. If we are determined to grind down all things under the

millstones of "invariable" laws, we may easily drop out of our philosophy the whole of this great system of co-ordinated agencies. Nevertheless, there it is; and each agent, from the insect up, has its own sphere of self-determined action, its own co-ordinated operation of laws, physical, intellectual, and social, within itself, and its own measure of power to interfere with the phenomena of nature, first within itself, and next without; that power of interference being as much part of nature as the most strictly necessitated sequence of physical law.

On the two great points of certitude no doubt or contingency will ever arise; no physical agent left alone will change, and if interfered with, it will modify by regular rule and measure. But these two points are but the chessboard on which is to be effected many unforeseen changes. The questions which these certainties leave to be asked are big with possibilities. What agent will next interfere with this one? will it be alone or acting with others? will it be merely physical, or organized, or animate? if animate, will it have small sagacity or great? when will the interference take place? in what force will it set in? how long will it be continued? and so on, into long vistas of not fanciful, but strictly practical possibilities. Now, when such questions arise, we may be able to answer some of them with tolerable certainty, some with extreme uncertainty, and some not at all. We would fain be able to predict everything. That means, we would fain make an end of all free agents, from the bee in his own sphere up to the human will. It comes back to what was said before—if we could foresee all the conditions we could predict results; which comes back to saying, if we could foresee all causes we could predict effects; for "all conditions" includes that agency without which the conditions would never

lead to the effect. Now, since suppositions as to what we might and might not do, were the system of nature what it never was, do not lead us to anywhither, we may as well drop them, and humbly take our stand on the firm ground set under our feet, that, namely, of the fixity of laws and the flexibility of phenomena.

VII.

In the scale of co-ordinated agency we find man at the head, on earth. His power of modifying phenomena, however considerable, is strictly limited. The limitation is carried even within his own person. He cannot determine the color of his hair, his stature, his strength, his beauty, the quality of his voice, or the expansion of his brow. Outside of his own person similar limitations follow him. He cannot alter one element in nature, nor can he make one combine with another in any proportions but the pre-established ones. He cannot impart to a compound any qualities but those which any one who knows the nature of the compound can tell. He cannot make inorganic bodies into organic. He cannot, by giving the same treatment to two organic bodies, make them produce the same effects; that is, he cannot get the same nutrition which in a rose-tree will turn into rose-sap, to turn also into rose-sap in a heath. Nor can he make the food which in a sheep will grow wool and mutton grow either wool or mutton in an ox. Dealing with animals, he cannot give to any organs which it has not, nor yet to any organ functions which are not natural to it. He cannot make organs and functions work in any element but their own. Lungs will not at his word breathe in the element in which gills will breathe, and fins will not swim in the element in which wings will swim. He cannot give his dog feathers, or his crowing cock an eagle's scent.

Were things such as these left to the will of man, they would be indeed left to caprice, and our relations with the external universe, shifting from moment to moment, and from village to village, would soon become one hopeless tangle. Equally evident is it that were they left to a number of independent wills, and possibly conflicting ones, moving in some sphere as much higher than our own as ours is than that of plants or animals, unity there would be none, but a perpetual war for departmental ascendency, or for general command. But any idea of government by departmental divinities is scattered into air by the grand and benign unity which assures to us firm foundations.

One of two suppositions must be chosen. Either these laws all exist, correspond, co-operate, and make effects sure without having been set by any mind, without having been adapted by mind to one another, or invested with its force; or, on the other hand, they were at first framed by one all-embracing mind, fitted to their respective agents, co-ordinated one with another, and linked to effective force by a will that changeth not. If any healthy mind can soberly face the facts, and then deliberately adopt the first of these two alternatives, then its form of human reason and view of human experience pass all my attempts to comprehend them. If a man only brushes the question aside as one neither to be affirmed nor denied, I think I comprehend him well. If the second supposition be true, then we have, in physical law, a fixed basis for all the flexible phenomena resulting from the combination of intellectual laws and agents, and of moral laws and agents, into one living system, whereof physical laws and agents are the skeleton. The bones of this skeleton are stiff, which is for us a needful prop and stay; but they are overlaid with much array of mobile tissue, instinct with subtle and yet mighty forces.

VIII.

The subordination of agent to agent changes its form when once we pass upward into the human sphere. Vegetable life can employ mineral forces if they are nigh at hand, but cannot bring them from a distance. Animals can use both mineral and vegetable resources, but cannot multiply them, and cultivate crops of the one or set up factories of the other; any instances in which some beginnings of such processes take place being only sufficient to call attention to their general absence, and to their limited range where seen. Animals can also live upon other animals, but cannot domesticate them and rule over them. In this particular, also, the rare instances in which they act as slave-owners only call attention to the general rule. Man can conquer distance by making to himself outlying limbs, and thus can remove and bring near what is all the world's breadth away. He cannot swim over an ocean, but he can make wood or iron swim for him, and carry him. He cannot run forty miles an hour, but he can make an iron engine and wooden carriages run for him, and carry him. He cannot cut oak in two, but he can make steel do it for him. He cannot fly to overtake birds, but he can make lead fly for him. He cannot go down into the deep sea to catch fish, but he can make nets go down for him. Not only is space thus at his disposal, but he can anticipate times and seasons, arranging in the day what shall act in the night, and in the night what shall act in the day. He can foresee the movements of the fishes, the birds, and the wild animals, so that plans which are to take effect six months hence are in progress to-day, and plans which are to take effect in the Arctic Seas, or in the South Seas, are in progress in ports of England or America. Thus has he

power over inorganic matter to make it his instrument of dominion over both vegetable organizations and animal life. He collects, under his own hand, the mechanical forces of the inorganic bodies; the twofold forces, mechanical and vital, of the plants; and the triple forces, mechanical, vital, and mental, of the animals. In some of his outlying limbs he will unite all these into wonderful co-operation. In drawing along one elephant-gun, for instance, we have metal, timbers, animal mechanics, and animal sagacity all co-ordinated to one end; the mineral retaining its dead qualities, the vegetable its organic qualities, the animal its self-moving qualities, and its self-guiding ones, except in so far as guidance is given up under consciousness of a superior power, which giving up of self-guidance into a higher hand is only another and a nobler form of self-guidance. So also is the consciousness of a superior power the tie connecting the highest wisdom upon earth with the lordship of its material forces.

What is here said of an elephant-gun holds good of one drawn by horses, or of a bullock train, or of a plough. Not staying at things under his hand, man combines in a windmill the spontaneous motions of the air as one of his forces, with the animal, vegetable, and mineral ones needful to complete his process. He makes the same use of water. And taking up from out of their deep tombs the jet-black stone coffins in which, for many ages, departed sunbeams have lain interred, he, by a gentle touch of fire, bids the stone dissolve from around its celestial prisoner, permitting the beams to flame forth again in a resurrection form, and, after their long, deep slumber, to mount once more towards their native place, serving man on their passage as the mightiest of all his auxiliaries in reducing matter beneath the sway of mind. In one and the

same act he is ruling over the various orders of force, placed on earth beneath him, and literally employing forces that were spent by the sun before man existed. He cannot raise up again sunbeams that fell only on dead matter. The dead may bury the living, but not keep them for a future life. Those only can he raise up again that were received as life from heaven by living things on earth, and so were conserved for a day, and a call in the remote future.

Man's power of combining the elements of his dominion does not terminate when specimens of the different kinds of force have been brought under his hand. He combines one order of animals with another, making some consort together in his domestic service, and turning to account the instincts and the products of others, for whose usefulness wild freedom is an essential condition. While the sheep, the ox, the camel and the horse, the elephant, the dog, and fowls of the air and of the water are employed in regular service, wild beasts, wild fowls, and wild fish are all made to serve as out-door factories of valuable goods, to be collected in due time. The difference between the utmost ascendency of one animal over others of a different species, and the ascendency of man over the various species collectively, is brought out in one of the most ancient accounts of the possessions of an individual. The like could never be said of the lion, tiger, elephant, eagle, or whale. They may lead captive, destroy, and devour, but they cannot subdue, reconcile, rule, and protect. "His substance was seven thousand sheep, and three thousand camels, and five hundred yoke of oxen, and five hundred she asses." What an array of the mechanical, organic, animal, and mental forces was here held under the force of one human will! And whatever mind the sheep had, or

the camel, or the ox, or the ass, was under the control of the nobler mind, just as whatever animal or vital forces each one of these creatures possessed was under the control of its own modicum of mind. The unifying power of the master-mind reigning over all these gave to each the direction it was best fitted to receive; and mind, vital forces, mechanics, all followed that direction.

IX.

As corresponding with this progress of power from above downward, we see in all the different provinces of nature a constant tendency in creatures of every order to point from themselves upward to something higher than themselves, and outward to something wider, for which, as well as for themselves, they exist. The rocks are not more remarkable for any property than for their tendency to become earths, thus saying, "not only for ourselves." The earths, when the chemist and geologist have said all that can be said respecting their physics, are most of all remarkable for their anticipation of a higher order of existence, for an invisible adaptation to nourish plants. The herb, very wonderful in itself, and in its relations to things below it, is most wonderful in its anticipations of animal life, in its invisible adaptation to feed animated frames. Not for ourselves, is the cry of all these. The animals, wonderful in all things, are not least wonderful in their anticipations of the wants of man, his wants of food, of clothing, of beauty in form, beauty in movement, beauty in song, of animated machines, and of attached though inferior servants.

A system of bounties and reciprocal service runs through all this chain of creatures. It is not for the good of the clay that are elaborated its nourishing principles. It is

turning what earth and heaven have given it into uses for powers higher up. It is not the grasses that need the seeds of grasses to live upon. It is not flax that needs either linen or linseed-oil. It prepares the material of the one and the other, "not for ourselves." Apple-trees do not eat apples. Cotton-bushes do not wear muslin. The eucalyptus does not dread malaria. The tea-plant or the coffee-plant need no nerve stimulant. Rose-bushes seek no pleasure in red or white, in exquisite forms or sweet odors. From the moss up to the mighty trees, every plant reaches up from earth towards heaven, having written upon the sap of it, and in every limb of it, the law that they shall provide not only for themselves, for their own nutrition and reproduction, but shall minister to the wants of higher things.

Turning again from the progress from below upward to that from above downward, we find man modifying phenomena in the animals, the plants, the earths, the rocks, and the metals—all down the line. No knowledge of either plant or animal as left to itself enables you to tell what it may be capable of when under the hand of man; and the same applies to all physical agents. For instance, no knowledge of wild horses would have enabled a man ignorant of cavalry drill to foresee what modifications of phenomena might be brought about in a single day, over a great tract in Egypt, by a couple of thousand horses, handled by masters who had moulded them to their own ends. The natural powers of the horses had been cultivated and developed by a higher power, till they had come to act as subsidiary minds under the higher mind, and as outlying limbs to the weaker yet nobler body. They thus became capable of what they never would have been capable of had they not been acted upon by a being of nature

higher than their own. It is needless to say that not one horse there would have done for another horse what he did for his master. He had been predisposed by nature to accept the control of the power fitted to enhance by culture his own powers.

A while ago we spoke of a flock of sheep under control of a shepherd's dog. They present a case more complex than that of the cavalry horse. In the latter case the dominion of man is exerted directly over his sentient agent. In that of the sheep it is exerted not directly, but through another sentient agent neither sheep nor man, but of a species very different from either. And what is particularly to be noted is this, that the dominion over the dog is not exerted mechanically by bit and bridle, or even by the more subtle mechanics of the voice. The dog is alone, with the shepherd at some distance, and his voice has for a while ceased to sound. But the will of the shepherd rules that of the dog. He has undergone the educating ascendency of man, which has modified his qualities, his habits, his powers of action. He recognizes his superior, cleaves to him, takes pleasure in pleasing him, fears to offend him. All this is but in anticipation of the daily use to be made of him in modifying the phenomena which would be developed in the flock if left alone "to its laws." It comes to pass that when the flock is heading to a given field, in which it would produce certain phenomena, it finds at the gap the will of the proprietor represented by that of the shepherd, and the shepherd's represented by that of the dog; and thus a torrent of phenomena which, had natural laws not been interfered with, would have overflowed the field, is turned aside, and that by one will acting through, it may be, two or three human ones, and finally through an animal one.

X.

The modifications of phenomena which can be made in a forest by an elephant are considerable. But man can modify them within the mind and frame of the elephant himself—can make him into the instrument of capturing his fellows, and of affecting the great phenomena of war. As the tiny driver, perched on the summit of that mountain of forces, sends will force through its nerves, and nerve force through its muscles, and muscular force through its bones, harmonizing the movement of its huge limbs with that of an army of whose objective point the elephant has no knowledge, who does not feel the might of mind in controlling phenomena?

It is vain to raise vapors around this superior power of mind by talking of the fixedness of physical laws, and the impossibility of breaking those laws. Ignorance is always assuming that things it cannot do and cannot understand are not to be effected except by breaking physical law. But there are three conditions to be taken into account before any one should commit himself to saying, Such and such an effect cannot be produced but by breaking physical law. First, be certain that no agent of a nature higher than your own is setting the laws in motion; secondly, be certain that the agent affected is not acted upon by one of a nature higher than its own; and, thirdly, be certain that if the agent setting in motion the physical laws is only of your own nature, he does not know more about them than you do.

It is manifest that an agent of one grade is not a good judge of what is contrary to nature in the case of an agent of a higher order. A worm starts this morning for its day's labor. It is perfectly fitted for the life and ideas

of its own worm world. It soon comes upon a lark's nest. A young lark begins to cry. The worm asks what the matter is. "I see an enemy." "See! What is seeing?" "He's a hundred yards off; I see him, and am afraid." "See! I don't believe in that. Things that touch one can be felt, but seeing at a hundred yards off would be against the laws of nature; and you know one cannot believe in the supernatural." The young lark goes on crying. "What are you doing?" "I am using my voice to call my mother." "Voice! What is voice? Something you say that sends your feeling out of yourself and shoots it across vacant space into your mother's breast. No, no, that would indeed be against the laws of nature, and I cannot believe in the supernatural." The young lark, however, replies, "She is coming." "How is she coming?" "She is flying." "Flying! I do not believe in flight. Motion on the ground is natural. Motion above the ground, where there is nothing to bear one up, would be contrary to the laws of nature, and, of course, there is no supernatural."

Now all this would be reasonable if the powers of the worm were the highest in existence. But there lay hidden from him in the lark three powers which he could not find in himself: those of distant sight, of voice, of flight. And so the reasoning of the worm about what involved breaches of the laws of nature was vitiated.

This case is that of an agent of a lower order fixing its own powers as the standard of nature, and inferring that what it could not do for itself no other being can do for itself, because of the laws of nature. Now, to look at a different category: at the case of one judging what an agent of a higher order can or cannot do to one of a lower, according to the laws of nature. Suppose an eagle

says, "Man is incapable of flying; he cannot follow me, or even attempt to follow me. They may talk of his invisible powers cleaving the air, and outflying flight itself. All that smells of the supernatural, and in all my voyages I never saw anything higher than an eagle. He cannot overtake me, it would be against the laws of nature." So the brave bird flies where, indeed, the human body can make no attempt at emulating him. But the human mind, using mineral, vegetable, and animal instruments—using will force, nerve force, bone force, chemical force, mechanical force — sends dead lead in pursuit of the bird, and ruling in the open sky the effect of all those forces on the rising and sinking, the curving and the rushing of the lead, guides it into the vitals of the eagle, and lo! he lies at the feet of his foe. What was supernatural to the eagle was natural to the man. Laws which to him were one-sided because inviolable, to the man were many-sided though inviolable.

A whale at home in some range of the Pacific, if told that a human mind at the other side of the earth was planning his death, might find proofs from experience that the things proposed would be against the laws of nature, and excellent reasons for believing that no existence so inscrutable and shadowy as that called a mind could compass the ruin of a whale, and that from a distance of ten thousand miles! But the impossibilities and improbabilities all vanish with the wand of mind; and a turbulent tragedy in deep waters tells that deeds which might reasonably be called supernatural by a whale, were within the nature of one capable of setting in motion laws of physics so various and so mighty.

Take a case where the agent to be acted upon lies farther down in the scale, below the line of consciousness.

Three apple-trees grow side by side. Whoever plucks fruit from the one on the right or from the one on the left says, Sweet; but whoever plucks from the one in the middle says, Sour. It is vain for this tree to sigh for sweetness; it was never grafted, and cannot graft itself. It is vain for it to appeal to its neighbors on the right hand or the left. They cannot make the tree good. It would be contrary to nature that a tree with such juices should bear sweet fruit. And if all the trees in the garden united to say, We do not believe that the fate of trees can depend on anything higher than trees, or that any Providence ruled by a thing so capricious as will can have sway above the self-evolving forces of vegetative organization; or even if they all went on to say, As to myths about minds, purposes, intentions, and volitions of an unknowable being called a gardener, they are idle, it would alter nothing. There is a being higher than trees. There is for them an invisible world called mind. That mind does hold over them the position of limited providence; but limited from above, not from below. And if the gardener comes, and performs the operation which he knows how to perform, the sour shall become sweet, the bad tree good. In this the powers of nature shall have been in nowise exceeded, or her laws broken. And over every evil tree in this thicket here present this evening there moves one mighty Vine-dresser, who rules over all the rules of the natural world, and under whose wise hand the wild branch may be grafted, not in the ordinary course, but, "contrary to nature," into the good tree, and may henceforth commence to bear fruit, both sweet and fair.

XI.

The case remaining to be noticed is that in which the action is between two beings of one and the same order, one of them, however, knowing more of the laws of nature than the other. I can remember in my early days, in India, when describing the Thames Tunnel to Brahmins, being told "That is a lie! To tell us that men and carts go along a road, with a river running overhead, and ships sailing on the river above the heads of men and horses—that is a lie!" The whole experience of Brahmin lore and history seemed to warrant this denial. Was not the story contrary to all the laws of nature? Yet it was true: the river was running, the ships were sailing over the heads of men and horses; and no law of nature was broken.

So, again, I have heard Arabs say, Make iron swim! Impossible! Contrary to nature: iron is made to sink. No man can make it swim. It would be supernatural. Yet we do make iron to swim by thousands of tons at a time; and not only so, but make it float men, women, children, corn, cattle, and all manner of goods. And when the huge iron steamer heaves her weight up between billow and cloud, is there one law of nature broken? is there anything there but proof of the power of mind in moving the laws of nature, and in consequently modifying her phenomena? proof that the head of the Arab covers powers and possibilities greater than he believes in, and that the limit to the sphere of mind can never be assigned but by higher mind?

What would seem supernatural to one generation—and would have been so—becomes perfectly natural to the next. The telescope and the microscope both carry the powers of the eye to a point which many an honest man would

pronounce supernatural. The telephone does the same for the ear. "It is contrary to the laws of nature to speak quietly and be heard two miles off." Yes, if the laws of nature are let alone; but if mind moves them in certain ways, it is not contrary to them, but is done by their ministry. The intellect of man helps him to invent extensions of the senses by mechanics, the reason always accepting a sensation, not as a specification of objects, but only as an index; not as an account of how many wheels are in a chronometer, and how many cogs in each, but as a proof that there are movements to measure, in one case hours and minutes, in another seconds as well. In mathematics the sensation is next to *nil;* but the relations of which it is the index, being correctly understood, reason educes from that minimum of sensation a maximum of knowledge.

Some one has said that prayer for fine weather, in certain cases, is something like praying that water may run uphill; both would involve a violation of the laws of nature. Water left alone does not by law of nature run uphill; but the learned professor who so spake has a heart that beats, and every time it does so water is sent running uphill to the top of his head. Water will run not only uphill, but up sidewalls, if mind adjusts the laws of nature to make it so do; and mind can do that easily. Water sometimes does more than run uphill. It has its own relations with other worlds, its own tendency to move and be in different bodies and dissimilar environments, its own capability of existence beyond the ken of sense. From his home on the Bell Alp, Professor Tyndall must have often seen some water lying white upon the summits, and, at the same time, other water which had mounted above the hill-tops, climbing up by the golden cords stretched out

to it from a distance at which Alps would be to human sight more undiscoverable even than are the minutest of the distinguished professor's infusorial germs to vulgar eye. This ascending water, hovering over the snow-wreaths on the summits, itself like snow-wreaths in the air, waited there for a little time before passing altogether from among things visible to things invisible, and taking its place with the waters above the firmament. Did it rise towards heaven uncalled? Did its disposition to soar represent no real relation between it and another world—and no part of its mission for this one? And in mounting, did it violate any law of nature? And, furthermore, in all the lone still wastes stretching away from it to the centre whence came the forces that lifted it upward, was there no mind to which the control of the laws that rule all the waters of this globe was a very little thing, much less than is the control of those which rule the leaping and falling, the curving and the scattering in spray of the waters of Versailles or Sydenham to the mind of the director? And while, from the bleak hill-top, the water rises upward in exalted relation with the centres of warmth, must mind from the same heights look out into black nothing, and say, No centre for me; no response from beyond to me; no career for me amid the spiritual bodies of the invisible; I must finish my journey alone?

And while in time of thirst the young of the goat and the sheep, of the ox and the chamois can ask for drink without being told by the dam that they must let the laws of nature suckle them; while these can ask without being obliged to use as much of whatever sense they have as would suffice to say, One of the great and pervasive laws of animated nature is, Ask and receive; and while in time of drought whole flocks can low in the ear of the herds-

man, asking for water, without being told that he can do nothing without breaking the laws of nature, is it man only who has no helper abler than himself, and is it nature in her whole only that has no unerring mind above her laws, whereas in all her parts she bears witness to a useful dominion of mind even though a mind given to err?

XII.

What appears, then, to be true is that no being of an inferior order can judge respecting one of a superior as to what may or may not be possible to him without a violation of the laws of nature; secondly, that what effects a being of a superior order may be able to produce upon one of an inferior order without a violation of the laws of nature, depends on what the mental powers of the superior may be; finally, that what can be done in modifying phenomena by a being of a given order cannot be judged of even by one of the same order, whose mental condition is greatly inferior.

It follows, as we have indicated, that what to one being is supernatural, because it exceeds the powers of his nature, to another being is natural, because it lies within the powers of his nature. This may be taken to hold good in an ascending gradation, till what is supernatural to the mightiest angel becomes natural to the Power whence spring all powers. According to this view, natural and supernatural run along side by side, from the lowest order of agents up to the highest, until every degree of might reaches its central point in Him from whom finite forces originally sprang, and within the powers of whose nature they all lie; in Him who, seated above all rule, and authority, and power, looks down upon them all, like the sun looking down on his own beams.

The co-ordinated action of the two orders of law is so manifested in nature, that no natural law is more natural, no unchangeable law more unchangeable, than is this one, that physical laws absolutely inviolable shall be set in motion by intelligent agents, and controlled in their operation by such agents, within determined bounds. The physical law rendering the physical agent an instrument free from all fickleness, and thus making foresight on the part of the free agent possible, renders it easy either to combine different agents to one end, or to set one of them to modify or wholly overcome the natural effect of another. And it would not be easy to say how much the whole sphere of science and of morals would be relieved of that muddy speculation, of which Mr. Austin most righteously complains, could men only be brought back into the habit of speaking as if they dealt with agents instead of dealing with laws. The knowledge of the law aids them in dealing with the agent; but what we call falling back upon a law is no more and no less than acting by will upon given agents with a knowledge of their laws, and consequently of the effect which our action is calculated to have upon them and upon other agents.

The augmenting power of agents, as they rise upward from the lifeless towards the moral agent, in subordinating the agents of a lower order to their own uses, is obvious. The plant cannot subordinate to itself locomotion, sensation, or instinct; but it can and does subordinate to its physiological wants certain molecules and masses. The animal of little sagacity cannot subordinate to itself a higher order of instinct; but every animal can and does subordinate certain bases and organs of vegetative life. Animals of a higher order of sagacity extend this dominion, the command exerted by mind gradually enlarging in pro-

portion as instinct takes a higher character, or as animal intelligence is given in increased measure. I use the phrase animal intelligence on the ground that all the mental operations of animals are manifestly not instinctive, any more than are all the mental operations of men of a class different from the instinctive.

In one word, vegetative life appropriates physical agents and rules their forces; animal life does the same with vegetative agents and their forces; mind with animal agents and their forces; and moral nature with mental agents and their forces. In the animal the place of the moral nature is taken by the wants and feelings connected with self-sustentation and self-preservation, also with its fellows, its brood, and its home. Whatever mental powers it may possess are moved at the dictation of those feelings to which its contrivances and feats of skill respond. But this is not its final social aspect. If it is an animal capable of entering into relations with man, dependence on him soon rules its other habits, and obedience to him modifies its impulses and the consequent direction of its movements. If it is not capable of holding relations with man, then, in most cases the fear of him will dominate its powers, such as they may be, whenever that fear is appealed to.

In the case of man moral considerations make calls at every turn upon his powers, mental and physical. These considerations beset the rule he exercises over the members of his body—questions of right and wrong arising with every voluntary act. The same is the case with the rule he exercises over his intellect, for he knows that his manner of cherishing or repressing its inclinations, and of lowering or elevating its principles, may entail momentous consequences, even if measured only by sorrow and joy.

Moral considerations follow him in his relations with his family, his neighbors, his countrymen, and human kind. They follow him in his conduct towards animals. Even when descending to deal with things without life he cannot strip off his dignities of right and wrong. Moral weight and measure of vast amounts may mark his relation with metal and grain, with fruits and their generous juices. At every turn the two possible paths of right and wrong open before him, at every turn the two possible goals of reward or punishment are within calculable distance. His moral qualities rule the rest by determining the direction of mental activity. A swindler may set great powers of invention and contrivance to play under command of a desire to cheat with *éclat*. A sensual poet may so impel exquisite powers of imagination and of music as to serve gross appetites. Ambition will sway one life, animosity another, benevolence a third, and religious zeal a fourth, the mental and animal powers in each case following the moral impulse.

And if a capacity for holding relations with a being of a higher order marks the nobler animals, does not an analogous capacity seated in the soul of man constitute its loftiest gift, its noblest opening upward? However vast, however minute, the objects to which it is presented by telescope, by microscope, or by any other extension of the senses made by mind-craft, it always accepts such objects as an index and not as the whole. Over the widest compass of space there is a wider thought, under the most infinitesimal atom a yet more subtle thought. It is not without proving untrue, both to its instincts and its reason, that the human soul can arrest its aspirations after moral relations at the line where its physical and mental relations are compelled, the one and the other, to go forth beyond

earth in order to find their highest spheres, or that it can at that line turn downward and refuse to recognize mental or moral being except below itself.

That constancy in his physical instruments which is assured to the moral agent by the inviolability of physical laws, coupled with his power of so setting those laws in motion as to modify phenomena in a degree which, viewed in the total, appears almost appalling, accumulates upon man a responsibility heightened by considerations drawn, in a very literal sense, from heaven above and earth beneath. The system of fixed instruments, provided to the hand of free agents, leads through the very way of the inviolability of laws to the flexibility of phenomena.

XIII.

To man the practical result is that though mighty he is accountable, though in power he is subject to power, though in authority he is under authority. This is the refrain that I hear echoing and re-echoing around him as I see him stand on the Alps or the Apennines looking proudly on the mountains he has just run through, and on the train with which he pierced them. True, that train was his own handiwork, and in its kind was "a body fitly framed and knit together through that which every joint supplieth, according to the due measure of each several part." But however much it testifies to the power of man over physical agents, it is beyond his power to command that frame of so many joints to make increase of the body to the building of itself up. That it cannot do. The wood of the carriages while it was still living could indeed build itself up. And yet it would have been in vain to counsel the tree to make increase by "building

itself up in love." Growing larger and stronger by love is a law whereof the live oak knows no more than the dead copper. As the soul sits within its shrine of muscles and of bones, sole power in that frame capable of transforming into a glowing thought the sound of the word Love or the sight of the letters that write it, so in the multiform train does the passenger sit, the sole agent there capable of being fed for growth or impelled for speed by the motive power of love.

When, therefore, emerging from the mountain-tunnel man looks up at the sun whose rays he has been taking from the coal, looks on the clouds whose gifts he has been sending back in steam, on the earth whose veins he has ripped up for tools, on the woods from whose fibres he has made frames to cover his own frame in its flight, on the animals whose forces he has first employed and then outdone, he is indeed conscious of being able to modify phenomena. That consciousness may bring with it a feeling of pride or one of awe. But can it ever fail to bring with it to his reason the persuasion that it is not in his brain that the power of modifying phenomena has found its highest seat?

PART VI.

WHAT IS FAIRLY PRESUPPOSED BY THE EXISTENCE OF THE TWO ORDERS OF LAWS, AND THEIR CO-ORDINATED ACTION?

It is from a saying of M. Littré's that we shall draw the same comfort, in respect of the final question now before us, as we drew at the beginning, in respect of the general question, from a saying of Mr. Mill's—that is, the comfort of clearly knowing what we have to deal with. The passage I shall quote is designed to give a summary of the whole scheme of the universe as disclosed for the profit of mankind, by the finished wisdom of the Positive Philosophy. The point to which I direct your particular attention is the last word. As to the first great department of nature mentioned, I do not undertake that you shall see, any more than I do, why considerations of number, measure, and motion should be attached to heavenly bodies as distinguished from all others, your ideas probably running, as mine do, in the common groove, in which properties of number, measure, and motion are looked upon as attaching to hailstones, carrier-pigeons, ponies, and herrings, all the same as they do to stars, and not to those bodies distinctively, but to any bodies whatsoever. This premised, I give M. Littré's words:

I.

"If we regard the sum total of nature, we find in it three groups visibly distinct. The first is the mathematico-physical group — that is to say, the physical properties and forces, with their numerical, geometric, and mechanical conditions. The second is the chemical group, with its actions exercised molecularily. The third is the organic group, with its vital properties. It is not allowable to arrange them otherwise: the vital group presupposes the two preceding ones, the chemical group presupposes the physical group, the last alone presupposes nothing."*

Now, in this utterance three points are clear. First, when we contemplate vital properties and forces, our understanding pronounces that there must have existed something before them, at least chemical agents; secondly, when we contemplate chemical properties and forces, our understanding pronounces that there must have existed something before them, at least physical agents; but, thirdly, when we contemplate physical properties and forces, our understanding pronounces that before them there existed nothing.

This word is clear, as clear as the ice of polar seas.

* "Si l'on considère l'ensemble de ce qui se nomme la nature, on y aperçoit trois groupes visiblement distincts. Le premier est le groupe mathématico-physique, c'est-à-dire les propriétés ou forces physiques, avec leur conditions numériques, géométriques et mécaniques. Le second est le groupe chimique, avec ses actions qui s'exercent moléculairement. Le troisième est le groupe organique, avec ses propriétés vitales. Il n'est pas permis de les ranger autrement: le groupe vital suppose les deux premiers; le groupe chimique suppose le groupe physique; celui-ci seul ne suppose rien."—Littré, *Comte et La Philosophie Positive*, p. 44.

And what, we may ask, is comprised in this department of nature called physics? According to Comte, it includes sun, moon, planets, earth, with light, heat, fluids, acoustics and electricity. Thus it comprises, in fact, all creation except organized beings, though it leaves out of view chemical properties, which none the less attach to every body included in the group. The mental artifice of abstracting the properties from their substances, and then grouping them, as not only mentally distinguishable, but also as "visibly distinct," is soon performed. It has, however, the inconvenience of easily beguiling the mind into treating its own ideal separations as if they were really carried out in the objects.

Now let the position of M. Littré be fully realized. He had brought his mind to accept a creed which taught that while you could not account for life without presupposing chemistry, and could not account for chemistry without presupposing the mechanical existence of bodies, you must say that light, heat, day, night, tides, eclipses, air, sound, snow, hail, comets, sun, moon, stars do not require anything to account either for their separate existence or their combined action. He did not want to say all this. He wanted only to say that they did not require, as a group, any mind, or thought, to have existed before them. The view that they did so was for him stamped with the bugbear of a theological fiction, and therefore must be forbidden by the Canute of Atheism to surge over any of his foreshore. But grant this essential postulate to M. Littré, and he would readily grant you in return that tides do presuppose water, and that water presupposes heat, and that heat presupposes several things, and so forth. Only be clear upon the point that in the sum total they do not presuppose anything.

This conception of M. Littré finds its matrix in one of Comte himself:

"To those who are strangers to the study of the heavenly bodies, although frequently masters of the other parts of natural philosophy, astronomy has still the reputation of being an eminently religious science, as if the famous verse, *The heavens declare the glory of God*, still preserved all its value. To minds early familiarized with true philosophical astronomy the heavens declare no other glory than that of Hipparchus, of Kepler, of Newton, and of all those who have aided in establishing their laws."*

Mark the language: "aided in establishing their laws!" as if we said that Blackstone established the laws of England, or Harvey the circulation of the blood. The fact is that Comte, having assumed the axiom that there existed no intellect except on this side of the stars, must suffer in intellect for doing so. Everything must show through this smoked glass. So to him the thing real or glorious was not the heavens, but our science of astronomy. The discovery of a law and its enrolment in the book of science was "establishing the law;" and whatever glory the heavens had to shed must not fall on any mind above the stars and above the laws, but upon such human mind as had climbed up towards their under-surface and spelled out the record from below. In any ordinary discussion, when nothing was involved but the quality of the reasoning, men would apply to a process like this terms which would not indicate their feeling that he who could so speak even off-hand was a sound thinker.

* As translated in Lewes's "Comte's Philosophy of the Sciences," p. 88, from "La Philosophie Positive," ii., 36. Lewes does not give the reference.

II.

We now see why it is necessary to enjoin upon us the duty of not asking why, and not seeking after causes; demands for self-mutilation of our intellects which are modestly made, not in the name of Atheism, but of philosophy. But we cannot help asking why, and cannot help seeking after causes. Mr. Mill, in noting the fact that even Comte, in practice, recognizes causes and accepts of them, oddly calls his dislike of them a dislike to the name. Two orders of law, such as we have seen to govern their respective agents and to establish among them relations, compel us to ask, How came they into existence? How came they to be combined? How came each order to be represented by a corresponding order of agents? You tell me that moral laws doubtless presuppose physiological ones, which presuppose chemical, which in turn presuppose mechanical, and that these presuppose nothing. That is, consciences receive law from tissues, tissues receive law from molecules, molecules receive law from mechanical masses, and mechanical masses receive law from nothing. Down from conscience to tissue, down from tissue to molecule, down from molecule to mass, down from mass to nothing, is the line of progress towards the fountain of law, towards the throne of all order.

Here we join issue: we assert that this order of dependence for law is contrary to all that men know, all that experience teaches, and all that reason can infer from things within knowledge and experience. It is an order that fixes the dependence for guiding rules of the intelligent on the mindless. We assert that it would not be more difficult to conceive of living bodies without the pre-existence of chemical agents, or to conceive of chemical

agents without the pre-existence of mechanical masses, than it is to conceive of the existence of the whole physical universe, with its properties and forces, without the pre-existence of thought, will, and power. We assert that the existence of that physical universe does suppose the pre-existence of a mind able to conceive the whole, and of a power able to embody the conception. We assert that natural habits of reasoning lead the mind, when in presence of such complex yet harmonized arrangements, to assume the pre-existence of an adequate intelligent cause. We assert that when the intellect is asked to believe in the establishment of such an order of arrangements without any foregoing thought, it is asked to do in this case what would not be asked of it in any ordinary case, except by one who meant to disregard the ordinary rules of reason. We assert, then, that the heavens do declare another glory than that of the men who aided in discovering the laws whereby their motions are ruled; declare the glory of a mind whose thoughts built the heavens when astronomers existed not—a mind of which the thought was as much higher than their thought as the heavens are higher than the earth.

When I am required to believe that a good account is given of all things by first abstracting from substances their properties and forces, and then by making three groups of properties and forces, and saying that, while among themselves the higher presuppose the lower, as a whole, they presuppose nothing, I am led to ask what would M. Littré have said if he had found me accounting with similar sleight-of-hand for his own great dictionary?

Suppose I had said, In this voluminous aggregate of phenomena we are not to regard the concrete, but only the abstract, seeing that we are philosophers, and not

mere scientists. To these latter belongs the concrete, as fitting their narrow spheres of speciality — a narrowness that accounts for their unaccountable stupidity, owing to which, while "they are hodmen, they fancy themselves architects."* Being, then, philosophers, we consider in our scheme of this aggregate of phenomena only properties and forces, not substances. Now, taking the sum total of what is called Littré's dictionary, we perceive in it three groups visibly distinct. The first is the literary group, with its linguistic properties. The second is the industrial group, with its actions exercised muscularly. The third is the group of commercial properties and forces, with their numerical, geometric, and mechanical conditions. They cannot be otherwise arranged. The commercial group presupposes both of the preceding ones; the industrial presupposes the literary, and this alone presupposes nothing.

M. Littré would, doubtless, grant that the commercial forces presuppose the other two sets, and that the industrial presuppose the literary, seeing that books could not be sold were they not printed, and could not be printed were they not written; but when we should plump out the affirmation that the literary properties and forces of the phenomena presupposed nothing, he might modestly ask, What, not a writer? Suppose I reply, "No, I do not know that the literary properties presuppose a writer; because we must not go behind the fact for an explanation of the fact."

* These words of Mr. J. H. Lewes are only an echo of the spite against men of science and of letters, but above all against geometricians, which is familiar to readers of Comte, who even went so far as plainly to hint that it would be no great harm if all the existing scientific bodies were suppressed. — *Discours sur l'Esprit Positif*, p. 79, foot-note, and *Philosophie Positive*, passim.

Philosophers and scientists would both say that M. Littré would not be satisfied with this reply. He might, indeed, forget that a phenomenon is to the reason an index of much that is not brought to the senses by such manifestation of an object as the phenomenon yields. He might try to keep up the make-believe that we do not, by means of a phenomenon, learn anything but just so much as eye sees, ear hears, or hands can handle. He would, however, all the time, clearly know that in a dictionary the invisible powers and accomplishments of a lexicographer are clearly seen, not by the eye in any measure, for it sees only black marks on a white ground, but by the mind, which in the black marks discerns an index of the invisible powers. True, the only object of sense is the phenomenon; but the object to the mind is that, whatever it may be, of which the phenomenon is the index.

Now the fact that each separate phenomenon to the sense is to the reason an index of much behind it, is one of those which no power of the Positivists will cut out of nature; and the corresponding habit of the human soul "to look behind the fact for the explanation of the fact," is one which all their cold steel will never excise. Their complaints of it are natural. It is a bad habit for their system. Under this good habit for mankind I take up Littré's dictionary and ask what does it presuppose? Without going beyond the book itself, I know with perfectly trustworthy knowledge that it presupposes paper, ink, and thread; also the factories where these materials were made, and a long train of preceding causes. I equally know that it presupposes types, type-founding, metals, and many things upon that line. I equally know that it presupposes the French language, and not a few other languages; and also the arts of grammar, logic, poetry,

and prose composition. Do I know or not know that it presupposes the mind of an author? That as surely as anything else; and, in fact, in contemplating the work, that is the one piece of knowledge which is most present to one's consciousness. If I know that it is the work of one author, I can also spell out a good outline of his powers. Nothing is more untrue in fact, or more hollow as an attempt at thinking, than to say that all we know from a phenomenon is the phenomenon itself. In proportion to the completeness of our knowledge of what the phenomenon is, will always be our knowledge of what it is the index to. If I feel a pulse, I may know little of what it indicates, and yet the phenomenon itself is the same to me as to a physician—that is, the same to my sensation, but to my reason very different.

So, when we look upon all the departments of nature and their order, we are not to be foreclosed from asking, Had they not an author? or from asserting, when we hear men speak of things being unknown and unknowable, that of all things unknown none is so completely unknown to the whole course of human experience as any system of ordered forces under working arrangements, corresponding even in the remotest degree to that embodied in the universe, without the foregoing action of a directing mind.

III.

Physical laws clearly presuppose the power of fitting unconscious agents to co-operate, first, with other unconscious ones, and, secondly, with conscious agents, and the power of adjusting such fitness to distances small or great, from the insensible to the practically infinite. To suppose that an adaptation crosses open space without mental control is not only a violence to intellect, but a frank defiance

to every form of experience. We know of mind as fitting the arrow here to hit there, as fitting the bell here to sound a mile off, as fitting the electric lamp on the ship to expose the works on the shore, as fitting the telescope to carry sight billions of miles beyond its natural range, as fitting the wires to carry the orders to buy and sell, indifferently, from one street in London to another, or from London to New York. These and such as these we know, but what we do not know is any case in which an adaptation does of its own motion take flight across blank space, sustaining itself on the wings of nothing. The power of fitting agents to co-operate presupposes the power of impressing upon them qualities whether transient or permanent. Such impressing of qualities presupposes a conception of the effects of such qualities, not merely on the agent itself and within itself, but their effects in relation to other agents. This knowledge of future effects presupposes, in the act which gives qualities necessary to procure those effects, will either positively to bring them about, or else to render them possible to conscious agents, capable of using the instruments fitted by these qualities for that purpose. And the whole presupposes power to carry into effect what was conceived and willed.

The permanent impression of properties upon physical agents would have been of some importance to a solitary human being, had only one existed upon earth; for he could not comfortably cook his meals if he should be always in doubt whether sticks would burn or not, and whether water would or would not boil. But the importance of constancy in physical agents rises into immeasurable height when they are to be the instruments not only of one free agent, but of innumerable ones, instinct with common purposes. If the master could not count on the tools, little

use would it be to hire workmen. If the merchant could not count on diamonds being brilliants in London as well as at the Cape, he could not easily deal in them. Therefore, the fact that if free agents could at will change the action of physical instruments the system of physical nature would be itself liable to be deranged, represents only one side of the truth. Human society would be without its material basis. No one would know what to count upon, and that endless exchange of offices between man and man, which forms the bond of life in common, would become impossible. Confidence being destroyed, energy would be paralyzed, and intercourse would be limited to animal necessity. There might be some intelligent animals, there could be nothing corresponding to what we know as human society. Even the wigwam and the snow-shoe, the mat cloth and the grass girdle, suppose a confidence in the permanency of the properties of the substances which yield them. This constancy is the tie connecting the lower realm of physical rule with the higher realm of moral law.

Moral law, besides the intellect, will, and power presupposed in physical law, supposes, further, love of the moral agents, and care for them. Indifference on the part of a superior to an inferior cannot go farther than not caring whether he shall be bad or good, noble or base. If intelligent, affection always sets a higher price on the qualities inhering in the one beloved than on any circumstances about him. The first object of moral law, then, is to elevate the doer of it; the second, to make him happy in his relations with his fellows, and to make them happy in their relations with him. Were the moral law, as found in Holy Scripture, fulfilled in every person, no one in the world would be a despicable man. No one in the world would make himself miserable in his relations with his

family, the public, or the nation. No one would make others miserable in their relations with him. No one would have an enemy, a tyrant, a detractor, or an ill-wisher. Every man would be noble, happy, a centre of happy influences. So far in regard only to the relations of moral agent with moral agent. But in regard to his relations with physical agents, just in proportion as moral law is ascendent over the passions and habits of men do their relations with physical agents become noble and happy. The debauched, the idle, and the malevolent may employ mental power over lower agents to the disfiguring of nature, the debasement of the man himself, and the undoing of his fellow-men. The good man will employ them for directly opposite ends. And in the hands of those who, in the discharge of personal duty and the promotion of the general welfare, pursue ends of peaceful industry, the face of nature grows fairer, and the unconscious tools she supplies rise into instruments and even works which minister to well-being in all time to come. This power of the moral agent over the physical one, and his consequent power of modifying phenomena, link the twofold province of nature into one system, connected from the lowest to the highest agent, and from one world to another, either by chains of contact or lines of communication. Each order of laws in itself represents infinite powers of mind, deliberate will, and pregnant acts. The two in co-ordinated operation carry all this up into the sphere of beneficent moral purpose. And you can ask me to believe that all this arrangement does not presuppose any arranging mind or determining will?

Now, I am free to say that to me such a demand appears to be not reason, but unreason; and unreason pushed so far as to be accounted for in men of sane mind not with-

out difficulty. We cannot banish our intellect to that arctic world of the agnostics where middles come without beginnings, beginnings without causes, and order without an ordainer; where mind begins by putting on the snow spectacles which prevent it from looking behind a fact for the explanation of the fact, and ends by bestowing on abstract humanity the attributes of Providence. If a man is resolved that his reason shall in no case compel his heart to unsay what he has said in it, namely, that there is no God, he may well begin by telling his intellect that it is not in a condition to be left at large, but must be put under restraint, and may well lace it up so tightly that it shall never ask why? to what end? or who did it?

This being done, he may enjoy such mental dignity and happiness as are coveted in schools and nurseries at certain moments, when the thing most desirable is that no one shall ask, Who did it? and the next object of desire is that, should the unwelcome question be asked, all should be contented with the answer, No one did it. The agnostics are well aware that in the ear of experience the answer, No one did it, is a coin of suspected ring. Therefore do they very sagely counsel universal intellect never more to put the question, Who did it?

IV.

Mr. G. H. Lewes, when offering to mankind a new theory of life, naïvely says, "I have been asked, and shall be asked again, Whence this spherical form? What is the cause which determines these higher multiples to assume the Spherical Form?"* A human sort of question, when we were being informed of the vast discovery that the form

* Comte's "Philosophy," p. 158.

of a spherical cell it is, and that in very deed, which makes the inorganic substance vital. In a case so sublime, men from any free-born school of thought would take the question as arising in the course of nature. Mr. Lewes makes the truly Comtesque reply, "I do not know. The question is one which no positive philosopher will ask, recognizing, as he does, the impossibility of our ever knowing causes." This merits no answer. The natural retort would be that, if it be so, no positive philosopher is a natural philosopher, if by that is meant one who interrogates nature in possession of his natural freedom. He is only a metaphysician of an eccentric, narrow school, decrying metaphysics and misemploying them.*

Mr. Lewes, however, can no more keep his intellect within the Comtist cage than the rest of us. Five pages before the above dictum he asks, "What is it which makes the inorganic substance vital?"† Surely this is demanding the cause just as the rest of us would do. And we never more plainly state a cause than he does [barring the circumlocution] when he says,‡ "The one decisive condition—the only one known—which can transform this blastema into a vital substance is simply *the assumption of a Spherical Form.*" It is true that Mr. Lewes's system does not allow him to say cause, but constrains him to go round about and say "the decisive condition which transforms." This is a periphrasis so transparent that one would hardly dignify it with the name of an evasion. Yet it is far enough

* Comte's favorite saying or quotation (I forget which it is), that "metaphysics are the art of losing yourself methodically," is translated by Mr. Herbert Spencer, "puzzling yourself methodically," that would be little. But losing yourself is just what the Comtists and their related tribe constantly do.

† P. 153. ‡ P. 157.

away from the straight course to help him into the mist in which he confounds the "decisive condition" that does it with the thing done. The thing done is transformation into cell form. The thing that does it—"the decisive condition that transforms"—is "the assumption of the form."

The decisive condition that transforms the soap and water into bubbles is the assumption of the spherical form! That is an adroit way of getting rid of pipe, breath, and boy by one back-stroke. Yet in sober fact it took all the three to compose the "decisive condition that transforms." "In saying," explains Mr. Lewes, "that the passage from the inorganic to the organic is effected by the assumption of the spherical form, I am really saying no more than what the facts reveal." Perhaps saying no more, perhaps not near so much, but anyhow saying something altogether different from what the facts reveal. If one said that the passage from a sentence framed in the mind to one in writing was effected by its appearing in manuscript, or that the passage from manuscript to type was effected by its appearing in print, or that the passage of a child from the mute state of the unborn to the vocal state of the new-born is effected by lifting up the voice, one might be saying even less than the facts reveal, but one would be saying what they do not reveal. One would be putting carts before horses, and blocking up channels through which the light ought to come freely.

Passages from one state to another form a great difficulty with those who dislike the idea of a First Cause. Yet it is useless to try to induce us to confound the step that completes a passage with what effects it. Landing at Liverpool does not effect the passage from America though it completes it. Turning into red-hot gas does

not effect the passage from gunpowder into smoke, but completes it. Or, to take an every-day case: Is the passage of an umbrella from its shape as a walking-stick to its shape as a rain-shed effected by its assuming the convexo-concave form, or only completed by it? Is it not effected by a mind moving a hand, which moves a spring, and finds its end answered as soon as the new form is completely taken? Who would give as the whole account of the change platitudes like this, "the convexo-concave form is universal to the umbrella as a rain-shed, and is the cause of its taking that form; or, if you prefer it, 'the decisive condition that transforms it?'" Yet this is an exact counterpart of the thing called reasoning resorted to when it is sought to avoid the natural conclusion of an intelligent giver of life as being suggested by life-giving. And no amount of such devices, or of any devices, will evade the fact that the passage from the tapering to the convexo-concave form came from this, that a mind saw in the convexity an adaptation to the end of rain-shedding, and in the concavity an adaptation to the end of keeping a dry head and shoulders, and that by will-force it made first animal, and, secondly, mechanical forces perform the movements which caused the passage to be effected. No more will any amount of clever evasion persuade men that the existence of an umbrella does not suppose the pre-existence of an umbrella-maker; or that the existence of an umbrella-maker does not suppose the pre-existence of mankind, of rain, of a knowledge of convexo-concave form, and of the power of working up stiff material, elastic material, and limp material into one varying and yet constant whole.

And here we may refer back to our illustration of the paddle-wheel. All that were there called causes in me-

chanics were the effects of an impulse given by mind. Axle or piston, coal in the box or water in the boiler, would have made no motion had mind let them alone. The various parts of the machinery moved because they were forced; they were forced because mind knew how to force them. The minds of the men moved because they were ordered. Mind could respond to mind. But why did the captain order it then and there? that is the true why of the whole matter. And this is his secret as long as he chooses, and if he chooses, for all his days. And it is the consciousness that all chains of causes lead up to mind as the true cause, and therefore lead up to God as the first cause, that gives rise to all the warping of plain facts to get out of the natural ideas of cause and effect. Of this warping, the most singular is the request not to ask who did it; not to inquire for any causes. Be content, they tell us, to waive the inquiry. You are not compelled to say that no one did it, any more than to say that some one did it. Can you not say, as I do, "I do not know whether any one did it or not?" No, I cannot say that, if I hold my own reason and universal experience in any respect. I do know that when a thing is done some one does it, and when a thing is made some one makes it, and when two things are fitted to one another some one fits them, and when wise and permanent effects are attained it is because wisdom has foreseen end and means, and power has effected what wisdom counselled.

We cannot reason on the steam-engine without getting back to the mind of Watt. Accessible or inaccessible, visible or invisible, that mind was the cause, and we know it. Stop us in the boiler, and refuse us leave to go farther back! Stop us outside the man's head at the bumps on his skull, and refuse us leave to go into the what eye

never saw, nor ear heard, nor up to his day had heart of man conceived! The case of the railway and the mind of Stephenson is the same. The case of the telegraph and the mind of Wheatstone or Morse is the same. Nature and knowledge are too strong for the system which stops with dazed eyes among the clouds of battle-smoke, and will not go in to see the source of all the movements and concussions in the minds of the commanders. To human nature and to all experience any one intelligent action presupposes thought, two such actions combined to one end more thought, and a vast multitude of such actions, complex yet harmonized to one end, implies wide-reaching thought. The force and depth of this thought become more and more manifest in proportion as mechanical instruments and free agents have to be united in common action. When by the union of such complex forces simple yet great effects are produced, the weakest of all weak things to say appears to be, I do not know whether any one did it or not.

You tell me that in contemplating the order of animated and inanimate nature you do not know that it does represent any foregoing thought and will. You do not know it! then, I most respectfully ask, what do you know? or what are you capable of being make to know? Surely you must know some secret behind nature which entitles you to set one foot on human reason and another on human experience, and simply to say, I am not to be forced into confessing to intelligent causes. That innumerable agents, operating in innumerable ways, and effecting innumerable ends, should be set each in an order of its own, and that all their various orders should be coordinated into one working whole without any foregoing thought having been bestowed upon them, is not a human

supposition. To form it is to set yourself on the outside of the human sphere, and, ignoring all that takes place within it, to draw your belief from an unknown and unheard of somewhere. On the other hand, we hear behind us the concurring voices of all reason, all experience, all nations, all ages, when we assert that order such as reigns under the twofold guard of moral and physical law never comes of aught else than foregoing thought: and the experience of man runneth not to the contrary.

V.

Mr. Mill puts a question as illustrating his doctrine of the laws of nature: "What are the fewest and simplest assumptions which being granted, the whole existing order of nature would result?"* With an ordinary writer one would know what this meant. With Mr. Mill one is not certain. If it means—as in the natural language of one whose view embraced the universe—it must mean, What are the assumptions from which would result all intellects, substances, properties, and forces, all systems, all movements, all processes, all creatures, with their minds, their wants and supplies, their orders and gradations of order; then is there but one answer. The sole fact from which all this could result is the eternal existence of an Intelligent Being greater than space, more ancient than time, and mighty with all power and might.

But Mr. Mill's ordinary range of view makes it possible that what he meant was no more than this: Given worlds already existing, suns in their centres, and planets in their orbits, from that basis to find the fewest principles from which "the whole existing order" would result. Or it may

* "Logic," vol. i., p. 366.

mean given matter, motion, and the universal forces, which would make matter into worlds, and so on. If either of these is the meaning, the question is much as if one was asked to state the fewest principles from which would result the whole order of England, but beginning no earlier than the Stuarts. Grant the existence of worlds, and you have already granted gravitation, cohesion, affinity, motion, illumination, reflection, and heat. Deny the existence of worlds, and then your problem is clear. Given space without either matter or mind in it, to find from what principles would result "the whole existing order of nature"—that is, all minds and all matter, with the whole of the properties and functions of both. The simple answer is, there would be no principles for anything to result from.

Every planet says, Not a whole, a part. The sun says, Not a whole, a part. So does every force, from gravitation down. So does every world that twinkles through distance. So does physical law. So does moral law. So does the physical agent; so does the moral agent. So does time; so does measureable or comprehensible space. So does the dimmest animal mind; so does the brightest human one. Parts, parts, parts, written everywhere—just as weighed, measured, timed are written everywhere. Parts imply beginnings, and parts call for a whole. But the human soul cannot stop at the beginning of a sun or a nebula any more than at the beginning of a telephone. It demands, And before? If you reply, "Other nebulæ," what of that? Only another part, only another beginning. And before? Before the mountains, before the world, before the sun, before the oldest star, before the first-born angels—what? Reason's ear hears not the reply, "Eternal nothing;" for out of nothing would have come nothing. Reason's ear

hears a still small voice, saying, Before the mountains, before the earth, before the universe, I AM; and reason replies, From everlasting to everlasting, Thou art God.

The human soul can no more stop at a part than at a beginning. It no more believes in knowing either completely or not knowing at all, than it believes in parts combining into beneficent wholes by chance; or in beginnings taking rise without a beginner. It believes in knowing even parts only in part. We all know some things, and yet the poorest things we know, in some respects pass our knowledge. Any of us can ask more questions about his own thumb-nail than all wise men could answer. Not one of our legislators is capable of seeing the whole of the Houses of Parliament. If he sees the inside, he does not see the outside. If he sees this chamber, he does not see the other one. He knows the building well, but he knows it in part. The whole of it never was really seen by mortal at one view. The nearest approach to the view of a whole was made in the mind of Barry, where it was built, doubtless, statelier and fairer than it now stands. And when we seek for the whole existing order of things which have had a beginning, and which have every one of them its bounds, nowhere can be found a complete view of that whole but in the thoughts of Him whose wisdom built it all.

There is a whole, and some one made it. The answer, No one made it, will not pass. The answer, We do not know that any one made it, will not pass. The answer, A mindless force in some of the parts made the whole, will not pass. The answer, We do not know who made it, calls forth the immediate reply, We do know that it must have been One who knew how to make it.

VI.

The anxiety shown by many to have the course of nature "left" to its laws, without oversight or intervention, leads us to make an effort to conceive and set before our minds a state of things, in some rudimentary stage of creation, wherein some one physical force is in operation singly, and is "left" to itself. What, in that case, would be the result? Manifestly the result would vary according to the nature of the force. Were the force heat, all things would be gas; were it gravitation, all things would be solids. Without gravitation heat would cause universal diffusion, in which there would be no base for a solid to rest upon, and indeed no solid to require a base. Without heat gravitation would bring forth universal stone; and there could be neither liquid nor gas, nor yet anything corresponding to water, milk, or air. The stone, immensely colder than ice, would lie in death alone; or the gas, thinner far than air, would sway and sway, empty of all inhabitants.

Even to the mind least accustomed to reflect it is manifest that in either of the cases assumed the action of the force must suppose the pre-existence of that upon which it has to act. I do not say that the force supposes the pre-existence of its substance; for both may have commenced their existence simultaneously, like a spoken word and its tone. But any action of the force does necessarily presuppose the existence of the substance. Diffusion by heat presupposes matter to be diffused; and solidifying by gravitation presupposes matter to be concentrated.

Now, our supposition is that there existed only matter and a single force—that is, matter and heat, or else matter and gravitation. Clearly no world-system could be con-

structed in either of these cases. Even for rudimental mechanical purposes matter endowed with only one force would be helpless. Not only must it be endowed with both heat and gravitation, but, unless absolute chaos is to reign, a balance must be held between the two. We would ask, then, Is it human to suppose that matter for heat to expand was provided, and also heat to give it expansion; and that matter for gravitation to concentrate was provided, and also attraction to give it solidity, and that between these two projectile or shooting forces, which wing their way from world to world, and penetrate to the innermost of every separate globe, a working balance was everywhere sustained, and all this without any forethought?

Let us now modify our supposition, and take matter as existing with two forces, say both heat and gravitation. Obviously, then, these would not suffice to constitute any system so ordered as to sustain animal or vegetable life. Matter having no more than these two forces operating within it would all be homogeneous, that is, all of one kind. Should heat predominate in a high degree, and all be gas, there would only be one kind of gas. Should it predominate in a lower degree, and all be liquid, there would only be one kind of liquid. Should gravitation so predominate that all would be solids, there would only be one kind of solid substance. If, therefore, distinctive forms of matter are to exist, and body is to differ from body, there must be added to the two universal forces of heat and gravitation another force which shall be at the same time universal and specific—universal, inasmuch as it affects everybody without exception, but specific, inasmuch as its operation varies with every separate body. Gravitation would never draw copper distinctively to copper, and tin to tin, sulphur to sulphur, or carbon to carbon.

A discriminating force must complete the work of the promiscuous one. As our minds conceive of this force we treat it as one (that is, subjectively), and call it cohesion. As it is found acting, it is different in every separate elementary body, so that in practical working (objectively) there are above sixty forces of cohesion—cohesion of gold to gold, of lead to lead, of oxygen to oxygen, of sulphur to sulphur, and so on. Each one of these pulls in its own direction, affecting this substance, and never heeding that one. Thus, as sheep flock together with sheep, and geese with geese, so does silver with silver, and hydrogen with hydrogen. Thus are the elementary bodies marked off by a clear demarcation from one another, and all ranged in the magazine of nature for collective use.

But the operation of each form of cohesive force presupposes the existence of the substance which it was to make cohere. Before a lump of lead can be formed by accumulation of particles of lead, those particles must exist. Hence we have first more than sixty rudimentary forms of matter, each different from all the others; and then, inhering in these, sixty various forms of cohesive force, each holding like to like. It matters not whether all these bodies were formed simultaneously, every one instinct with its own force, or whether they came by separate acts of production. In either case they presuppose forethought. The adaptation of one body to another, and of all to beings higher up in organic and animated nature, stamps each particular element as an instrument formed beforehand for uses to appear later. This remark applies as much to molecules as to large masses. When taken separately the molecules of any particular substance possess an identity both of form and of qualities which yield a backward trace of their origin in a common ideal

formed within one producing mind. They also possess the power of forming an aggregate harmonious in itself, and distinct from all substances composed of any other kind of molecules. This adaptation to form kindred and distinctive wholes yields a forward trace of the destination of the molecules to a common use.

Surely it would have been no great boon to creation had matter been "left" to the care of one law. Nor yet if it had been "left" to the care of two. Even at the point when sixty-odd forms of the law of cohesion have appeared, what would have been the result had creation been "left" to them, united to the other two?

With only gravitation, heat, and cohesion — the clinging force added to the shooting forces—we should have had elements, and might have had mechanical mixtures, but compound bodies we could not have had. The clinging force tends to keep like to like, and if "left," would have given us a world of separate elements. A combining force must be added, if out of old bodies are to be formed new ones, with new properties and capabilities. This combining force appears in the form of chemical affinity, and through its operation each elementary body, in addition to its separate virtue, becomes the possible constituent of many new substances rich in diversity of properties. If oxygen combined with nitrogen can make air, and (combined with hydrogen) water, to effect such combinations, resulting in entirely new bodies, the elementary bodies must have had their own nature imbued with a property in the mysterious force which we call a chemical affinity, which means a predisposition to unite with certain other bodies, and thus implies at least a recognition of the co-existence of such bodies. The action of this predisposition is regulated by strict proportions, and

from those proportions there is no swerving. Every such predisposition is therefore an anticipation of new bodies not yet existing, with new properties not yet displayed, and consequently is an anticipatory adaptation to purposes not yet above the horizon of finite mind when first the affinities took their place in nature. Do all these anticipatory adaptations not imply any forethought? Would the "leaving," so greatly prized, be more advisable before the introduction of these properties or after?

As it would be impossible to have solids, liquids, and gases without matter, or to have them without matter united with heat and gravitation, or to have them without the maintenance of a balance between these two forces, and as it would be impossible to have distinct and distinguishable elements without cohesion, and as it would be impossible to have compounds without chemical affinity, so would it be impossible, without a combination of all these, to have a single morsel of anything upon which we and the plants live, or to have air or water, or any one of the tissues that yield us raiment. It would not, then, have been any advantage to us had nature been "left" to its laws at any stage earlier than that at which all these just named had come into full operation.

Yet these are but the foundations—foundations that did not lay themselves—foundations that were not laid without a view to the coming superstructure—foundations, certainly, that were not capable of drawing the plan and making the architect; for they are not capable even of doing wrong, any more than the stones under your own house. The most hasty enthusiast of atoms never reckoned as among their possibilities the power of doing what they ought not to do, or even the power of leaving undone what they ought to do.

Probably those whose idea of government is that of laws "left" to work themselves out, would say that, of course, they do not mean laws of nature of one single class, or any partial selection of them, but the entire number as they exist. Taking, then, that entire number from the laws of the two shooting forces which found our mechanics to those of the clinging force, and the combining force which found our chemistry, onward to those which rule all the forces of vegetable life, those that rule animal life, and upward to mental, moral, spiritual life — all of which must be included if nature is to be taken in the large sense, and not in the little one—is it possible to contemplate them all without feeling that the unity of operation which pervades them points backward towards one originating mind, and that the harmony of uses subserved by them points forward to the purposes of one such mind as the end of their existence? What, then, is the proposed benefit to be procured by that mind "leaving" everything to work itself, as a mindless machine, without a soul to oversee it? The constancy given to physical law, and the unalterable character of moral law, both attest the fixedness of that will which ordained them, and in which there is no variableness or shadow of turning. The Comtists are incapable of elevating their idea of "volition, natural or supernatural," above the level of caprice. The Bible finds the stay and pledge of all stability in the purpose of God. Men also, in their practical affairs, habitually look to some firm mind as the best guarantee that things will be well directed. They would coldly welcome the proposal to "leave" the laws of nature to rule us, without any intervention of "volitions natural." If we proposed to leave the fields for the next seven years to be governed by invariable laws with which no volitions, natural or super-

natural, interfere, every Positivist farmer, miller, baker, dealer, eater, would hesitate as to the sound philosophy of our scheme. If we proposed to "leave" the seas and shipping to be so governed, Positivist merchants would doubt, and so would all their customers. If we proposed to let all the cotton, wool, silk, and hides now existing be governed only by invariable laws, keeping away from them all volitions, the most atheistic manufacturers or operatives, traders or wearers, would cry out for a reign of will above that of lifeless law. In spite of the cribbing and contorting to which they have exposed their habits of thought for the sake of their system, they have the underlying human knowledge that all which lifts our condition above that of erect worms is gain from finite and very fallible will taking up, in its own sphere, the active oversight and practical direction of the physical laws. They dare not wish that human will was deposed from its seat, and physical laws "left" alone, without control of finite will, a control necessarily but in part. If only the Eternal Ruler can be ignored as a thing not to be even admitted into the range of assertion and denial, they will be content. But here reason rises up against their dislikes as much as experience does against their explanations; for if finite good is educed from physical laws by the active intervention of finite will, we calmly look for infinite good to be educed from them by the ever-active intervention of Infinite Will.

We positively know that the knowledge of physical laws enjoyed by man, imperfect as that knowledge is, and the resulting power of direction over them which he possesses, limited as that power is, form an important feature in the system of nature, and one on which depends all that converts the sluggish lodes of physical order into

the current wealth of human happiness. Then we return to the question, Is there any colorable plausibility in the supposition that all the knowledge of those laws existing anywhere is man's knowledge of some of their parts? or that all the power of direction exercised over them anywhere is that exercised by one who is himself in numerous ways dependent on their power? or that all the balancing and harmonizing of them effected anywhere is that effected by a being incapable of framing one single example of such laws, and utterly incapable of so much as surveying the whole of them, not to speak of guiding their collective action? If human reason has any worth at all, and if hatred of belief in a living God is not to push reasoning out of all high thinking—for men may think much and reason ill—surely we must say first that the existence of physical laws in such number, with such potency and in such combination as those wherein they are actually found, implies the pre-existence of a Creator capable of conceiving a world-system beforehand, and implies also the act or acts of His mind whereby practical embodiment was given to His conceptions. And surely we must say, in the second place, that the continuous operation and harmony of this great system implies the existence and the exercise of One Mind possessing a comprehensive knowledge of them as a whole, possessing a power of directing them free from bonds and limits other than those adopted as rules to be kept, a mind cherishing in the direction of them a plan and purpose into which personal dependence on any portions of them, or personal opposition to any rival dependents, could in no wise enter.

What the students in the Polytechnic School used to say in jest of Comte, represented, as jests so often do, a great truth. Indeed Robinet, the devout worshipper of

Comte, accepts it with pride as a proof how well it was understood that Comte was completely "emancipated," that is, freed from all belief in God. "The students," writes Robinet, "used to say, 'Papa Comte has put God into an equation, and found no roots but imaginary ones.'" Precisely. He wanted to find either square roots or cube roots. He did not find either cube roots or square roots. All other roots were imaginary. His philosophy is a philosophy of parts; for of all manifest parts things that can be numbered are most manifestly so; and numbers are not even parts, but only the signs and notes of mind used in distinguishing parts. The universe itself—outside of the solar system—was rather an encumbrance to Comte than an illumination. It could not be "ticketed," to borrow the strictly correct term of the Duke of Argyll. And the few things said about the universe beyond the solar system by Comte contained enough of shortcomings to indicate how much his habit of keeping the eye of the intellect always fixed downward on the measurable and the numerable had impaired it. The eagle-wings of the soul were lost, leaving behind a plodding thinker, a bold speculator, and a weak reasoner.

VII.

"I'll tell you why I am a republican," said the leading physician in a great provincial capital in France—"I have dissected many men, and never found anything in nobles different from the rest of us." Now it is not to be denied that educated men are capable of saying things like this with a smirk, as if they thought that they were thinking. It is humiliating when applied to matters so grave as those which involve the welfare of a nation; but when just such trifling, presented in the form of solid nonsense, is imported into the grand concerns of creation, nature, faith, and

eternity, it is more humiliating still. Dr. —— might have dissected all the physicians and all the dentists in France, and found "nothing different" in the one class from the other; but that would not have weighed a feather in his decision when the question was as to the class to which he would intrust a case of bad teeth, and the one to which he would intrust a case of heart disease.

It was just reasoning of this quality which Comte thought good enough for his disciples, when he settled the question that the adaptation of the solar system to our wants did not imply any superintending mind or foregoing plan; for he argues, "According to the laws of astronomical mechanics, the continuous existence of animals is a simple and necessary consequence of certain characteristic circumstances in our solar system."* These circumstances are such as the smallness of the planets compared with the sun, the fact that their orbits are but slightly eccentric, and also that the inclination to one another of the planes of those orbits is not very great. Hence follows that stability which non-"emancipated" thinkers might look upon as indicating design. Now comes what is more comical still, when viewed as profound argument: "Besides, on *à priori* grounds we should anticipate in general such a result, if we make this single reflection, that since we do exist, it had to be, by strict necessity, that the system whereof we form part should be arranged in a manner to permit of that existence, and this would be incompatible with the total absence of stability in the principal components of our world." On these grounds he soberly concludes that the argument from design comes to the childish utterance

* The passage is the famous one from which I have already quoted at the beginning of this chapter.—*Philosophie Positive*, ii. 36–39.

that in our system there are no inhabited worlds but such as are habitable. He finds that those who admire the wisdom shown in the heavenly bodies are the anatomists, and those who admire the wisdom shown in the structure of animals are the astronomers.*

Now this is thinking, this is philosophy, this is science, this is reasoning, according to some. According to others, it is the sort of spleen to which we are to surrender our brains.

There are no worlds inhabited but such as are habitable! And the fact that worlds are habitable is enough to explain itself, without any wisdom in making them habitable! The mechanics that make them steady make the inhabitants, and fit the two for one another. Comte is quite complacent when he has assigned reason for the "continued existence" of animated beings, utterly insufficient though that reason be, and does not even see that "continued" existence presupposes a beginning of existence, but takes it for granted that beginnings come of themselves. The "continued" existence of the English in New Zealand may be accounted for by the erection of an English Government, but their first entrance on the scene is another point. There were in Paris no inhabited houses but such as were

* Vol. ii. 37, foot-note. On the next page Comte actually describes in terms "the essential stability of our solar system" as "the final result of the sum total of mathematical labors on the theory of gravitation." This helpless jumbling together of objects in nature, with the ascertainment of their existence by human study, is habitual with Comte. Again and again is one reminded of the words wrung at last from Littré by the attempt made in the introduction to the "Synthèse Subjective" to identify Logic and Mathematics: "In this attempt one can see only the effort of a mind enveloped in the mysticism of subjective illusions which thinks by its mere word to overbear objective realities."—Auguste Comte, p. 566.

habitable. Therefore, it was childish to say that any one had made them habitable. Their being habitable was a necessary result of a roof, walls, floor, and stairs in such and such proportions. Therefore, it was absurd to say that any one fixed the proportions, or put up the parts mutually proportioned. Since the inhabitants were actually in residence, we must *à priori* suppose that the state of things would necessarily permit of their residence. Therefore, it was childish to say that any one brought about that state of things; and the fact of such a state of things being itself in existence, caused, "by strict necessity," the origin, existence, settlement, and comfort of the inhabitants, which inference is a fact so philosophic and self-evident to heads that ignore causes, that it is not necessary even to weigh the hypothesis — the "theological speculation"— that the tenants might need something more than mechanics to account for them. Builders may not be skilled in "converting" propositions; but practically they know that because it is a fact that no houses are inhabited but such as are habitable, it is not also a fact that all houses that are habitable are inhabited.

Total want of stability in our world would be incompatible with our existence; therefore, it needed no wisdom to give the needful amount of stability, though combined with motion of inconceivable velocity. It is quite enough to say, It had to be *il faut bien;* that is, if we were to exist, there must be a house built that we could exist in. Of course the end presupposes the means; and this fact could not be more fully conceded than in these words, though with utter unconsciousness. Total want of stability in the railway-carriage would be incompatible with our travelling at all; therefore, seeing that here we are, eight of us, side to side and face to face, all rushing along at

the rate of fifty miles an hour, yet all sitting still, one reading, another chatting, another munching a biscuit, and seeing that this is a perfectly natural, indeed a necessary result of the characteristic features of a railway, especially of the fixed plant, the rolling stock, and the motive power, it is childish to think that this result was fore-arranged by wisdom; and, of course, it would be babyish to suppose that things with such brave names as fixed plant, rolling stock, and motive power would be the better for the eye of either engineer or guard. And did we only put the Greek names upon these things, they would then be exalted above all "unemancipated" arguments that fetter themselves by holding on to a chain of sequence. Indeed, the people that admire the wisdom shown in a railway are doctors who do not know its difficulties; and the people who admire the art of healing are engineers who are unaware of its shortcomings.

The craving to be ruled, not by intelligent oversight, as sons are ruled, but by mindless forces, as sticks and stones are ruled, is not only crawling instead of soaring, as we are born to do, it is more, for it might be possible to crawl and yet preserve the feeling that we are called to something nobler; it is debasing the soul itself into thinking, or at least into trying to think, that it thinks that to be without a head, a father, and a home forever, is something to be proud of. The most humiliating carnality of mind is not mere animal sensuality, but that deeper dye of carnalized intellect in which hope and fear themselves, those outriders of our career, are sent forth to scout with eyes bandaged, and permitted only to take in light which strikes from below upward, and to view only things which end in dust. The most terrible form of enmity against God is not that which breaks out in foul oaths or passion-

ate fits of disobedience, but that which deliberately drills the intellect to ignore all evidence of His existence, and to refuse an ear to any voice that speaks for Him, whether within the soul or without.

We know that were the laws of nature left from this night forward without that measure of overruling direction which the human mind is capable of giving to them, the effects would appear early to-morrow morning, and would develop in rapidly increasing proportions. The fires would have to light themselves. Those that were alight, whether in home, factory, or blast-furnace, would have to feed themselves. The wheat would have to reap itself. We must tell the cows that the wise men told us that natural volitions must not interfere with invariable laws, and so we could neither milk them nor fodder them. The steamers must steer themselves, the trains guide themselves. The drugs on the chemist's shelf must compound themselves, the bodies in the dissecting-room dissect themselves, and the wards of the hospital, undisturbed by wills, and with every sort of asking and receiving strictly excluded, must evolve convalescence under the untroubled flow of invariable law.

"Left to be ruled by its laws," the exchange would not be any longer a market, or the bank a place of transactions, the streets would be desert, the building partly up would remain as it is, nature would lack her complement, and man would be fallen from his place, to take part with other reptiles. Laws proper are made to govern free agents. Laws physical are made to be governed by free agents, while themselves governing fixed instruments. While serving the skilled free agent they do absolutely govern instruments; but the extent to which any being possessed of intelligence can govern them depends wholly

on the measure of his intelligence, which is not to be estimated by any inferior mind, indeed, is not justly and fully to be estimated by himself, but only by a mind above himself. Man a century ago knew not the extent to which man could govern physical law. Man to-day knows it not; but he does know that the extent of such government is vast, and that its boundary-line is not a fixed but a moving horizon.

If, then, physical law is manifestly made to be governed by intelligence for good ends, and if the effects of terminating the government of man's erring judgment and partial knowledge would be woe and bitterness, what is the measure of that inanity which babbles about "leaving us to the laws of nature," as if the sleep and absence of an all-wise Master was the one thing needful to give laws a full opportunity of showing their virtue?

The assumption that no alternative exists but one of two, namely, either to derange the system of government by fixed laws, or to suspend all intelligent control of it, is an assumption purely imaginary, formed in the face of all experience. The way it is thrust forward by some, and allowed by others, is one of the marvels of mental illusion, one of the fruits of making our own capabilities in relation to the laws of nature the standard for those of all conceivable agents. If I see in a cotton-mill tens of thousands of threads simultaneously being spun, and one of them breaks, I have no alternative but to stop the whole movement or else to leave that thread to be spoiled. The cry of its snapping and confusion to me is idle. "How can I derange the entire mill to help you?" would be all I could say. Is that all that can be said by any one? Is there not at hand one whose knowledge is such that, without any derangement of the general plan, without any in-

terruption of the general process, without violation of any law, he is able so to govern the action of the law that the one thread and the "frame" containing it are for a moment taken into the private care of mind, the thread is repaired by mind, and by the same mind the frame is again connected into the ordinary current of "law." Here you have fixed law and flexible phenomena, just because you have unconscious instruments—to wit, both unconscious structures and unconscious forces—watched over and controlled by the mind of competent agents. Leave the mills of Europe and America "to their laws," and they and their laws will do nothing, exactly nothing all next year. Leave them "to their laws," in the petty sense against which I am contending, and their laws will leave them to you—between you both the mills and all that is in them will go to the bad. The highest law of the physical rule is that it shall await the control of will and intellect; standing still, like a well-trained steed, till the master mounts and intimates that it is to turn this way or that, and to set off at a round pace or quietly.

It is the assumption above noted which Professor Tyndall not only utters but prints, and prints again.* "Without a disturbance of natural law quite as serious as the stoppage of an eclipse, or the rolling of the river Niagara up the falls, no act of humiliation, individual or national, could call one shower from heaven, or deflect towards us a single beam of the sun." The writer is not content with asserting this as his personal belief. He wants to commit Science to it. He writes, "She does assert it." Professor Tyndall asserts that she asserts it; but Science never makes assertions on a point about which

* "Fragments of Science," 6th ed., vol. ii. p. 5.

she knows nothing. And on this point Science knows no more than does the wisest cat in an hospital know upon the point of how far the request of a patient can or cannot obtain from the physician a change of regimen; or upon the other point, how far it is or is not possible to the physician to change the regimen of a given patient without a disturbance of hospital order as serious as if he poured the milk down the chimneys and sent in the medicine-bottles through the key-hole.

On any fact of physical science, of course, I should not dream of arguing with Professor Tyndall. But the above assertion is not physical science; it is pure metaphysics; and when he enters on that ground, Professor Tyndall is not exceptionally formidable, even to very common men. How his metaphysics may affect even physical generalizations is obvious in another assertion. He holds that if prayer can affect physical phenomena, "it necessarily follows that natural laws are more or less at the mercy of man's volition; and *no conclusion founded on the permanency of those laws would be worthy of confidence.*" I have italicized the last words. The fact is that no physical law is at the mercy of any human will to break it. The fact also is that a great array of physical laws are under direction of the human will as to the time, place, force, and duration of some particular action of theirs. And another fact is that this does not in the least invalidate conclusions founded on their constancy. It is certain that an appeal of the animals to human will can obtain modifications of phenomena, not by disturbance of law, but by confidence that it cannot be disturbed; and the metaphysics that tell us all the impossibilities that attach to One higher than man are not science, and are not passable metaphysics.

When, therefore, it is demonstrable that to dispense with

the partial control of physical laws, afforded by the scant knowledge and limited powers of man, would involve disorder and degradation, is it the voice of reason within us, or that of unreason, which hankers for deliverance from such control over their collective action as would be supplied by perfect knowledge, infallible wisdom, all-sufficing power, and infinite goodness? In the case (just supposed) of the mill, would it be the intelligent worker or the unintelligent one who would say, The spinning-frame if left to its laws could never get on; it must be looked after, but that is no reason why the department should require an overlooker? And would it be that one of the overlookers whose moral condition was the most exemplary who would say, The departments would never get on without overlookers; but as to a general manager for the whole mill, there can be no need of that; and, then, those general managers are so interfering?

The substitution for the noble Biblical idea of fixed law under firm will of the poor conception of a Creator making His universe and "leaving it," is one that encounters new difficulties at every fresh aspect of it. When would they who want to acknowledge a Creator, but one who has left us, say that He ought to begin the process of leaving His creation? was he to leave all portions of it at once? Was He, on the other hand, to leave little worlds like ours and not great ones like the sun? or was He to begin at chief centres, and leave our sun, and the sun of suns? Seeing that similar physical laws exist in different worlds, it would seem as if the "leaving" must equally apply to all.

Then how was He to leave them? by withdrawing His presence from portions of His own universe? by shrinking out of existence in some tracts of infinite space? by laying

aside part of His knowledge and power? by forgetting? by going on a journey? by being asleep? The Creator leaving creation! to go whither and to do what?

VIII.

But, after all the declamation of the Positivists against "caprice" and "arbitrary" interference with the dominion of unconscious rules, do they stand by their colors? Not in this respect any more than in others. As soon as their fancies on this matter come to be turned into working facts, and even while this is as yet only in anticipation, the facts make sport of them. The task they had to fulfil was to reorganize the human commonwealth on the new basis, which they proclaimed as the final one. Could they plan a reorganization without a God? They thought so. Could they plan it without a Providence? They thought not. So they undertook to construct one, and what a construction!

When the Republic of 1848 was in power, Comte published his "Discours sur l'Ensemble du Positivisme," and set upon the title-page this motto: *To reorganize* [*society*] *without God or King, by the systematic worship of humanity.* The moral purpose of the whole school of the Positivists was never better expressed. It was not so much the king from whom "emancipation" was desired as the King of kings. For just after Louis Napoleon's *coup d'état* Comte gratuitously seized the occasion of issuing his catechism to record in the preface his satisfaction at "the happy crisis" which had just resulted in two great steps, "the abolition of the Parliamentary regime, and the institution of the dictatorial Republic—the double preamble to all true regeneration." In the same preface he did homage to Nicholas of Russia as "the sole truly eminent temporal chief of

whom our century can claim the honor, up to the present time."

Comte himself doubtless fancied he saw some connection between the spirit of the *coup d'état* and that of the reign of Nicholas, and the millennium of "emancipation" from the idea of a God, to which his eye was turned; the announcement of which millennium he proudly sets in the fore-front of the catechism, as follows: It is necessary to remark that with him "the theoretical and practical servants of humanity" were the official designations of different orders of his disciples. "In the name of the past and the future," he cries, "do the theoretical and practical servants of humanity" come forward worthily to take the general direction of terrestrial affairs, in order to construct at last the true providence, moral, intellectual, and material, by irrevocably excluding from political supremacy all the diverse slaves of God—Catholics, Protestants, or Deists—as being at one and the same time behind the age, and disturbers."*

* "Au nom du passé et de l'avenir, les serviteurs théoriques et les serviteurs pratiques de L'HUMANITE viennent, prendre dignement la direction générale des affaires terrestres, pour construire enfin la vraie providence, morale, intellectuelle, et matérielle; en excluant irrévocablement de la suprématie politique tous les divers esclaves de Dieu—catholiques, protestants, ou déistes—comme étant à la fois arrières et perturbateurs."—*Catechisme Positiviste*, deuxième edition, p. 3.

After the foregoing was sent to the printer, having got back to London, I referred to Dr. Congreve's translation of the "Positivist Catechism." That of the above passage is not, like mine, strictly literal. But Dr. Congreve had the personal sanction of Comte for changes in arrangement at least, and probably also in meaning. The most striking variation from the original is the substitution of the term "servants of God" for "slaves of God." This is an obvious

The mental inability to conceive of the service of God as being perfect freedom, or partial freedom, or anything but slavery, which in this man's case seemed to have become complete, may have had an influence in shaping the state of mind to which the *coup d'état* was a "happy crisis," and the abolition of representative government, with the establishment of a dictatorship, was a prelude to true regeneration. He to whom the servant of humanity is a servant, and the servant of God a slave, may well turn upside down the most ordinary human relations. He to whom the ideal of "emancipation" is that of relief from belief in God, may naturally welcome any reign of brute force. He

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accommodation to the English feeling, seeming to set believers in God not so utterly beneath "servants of humanity." "Terrestrial affairs" is rendered by "this world," as if the largest possible meaning was to be attached to Comte's wide phrase. "Construct a providence" is rendered by the less blunt "constitute a providence." It is rather instructive that where Comte only says that his disciples come forward "worthily to take the general direction," Dr. Congreve —no doubt correctly—understands him to mean, "to claim as their due the general direction of this world." It will be observed that the single sentence of Comte is divided by Dr. Congreve into three. The logical effect, however, is carefully preserved, and, curiously enough, it is so thrown up into relief as to make the "consequent," which is the exclusion from power of the slaves of God, result from an "end" or "object"—that, namely, of constructing a providence. Thus, it does not merely succeed to an antecedent.

Dr. Congreve's version is as follows: "In the name of the past and the future, the servants of humanity—both its philosophical and practical servants—come forward to claim as their due the general direction of this world. Their object is to constitute at length a real providence in all departments — moral, intellectual, and material. Consequently they exclude, once for all, from political supremacy all the different servants of God — Catholic, Protestant, or Deist — as being at once behindhand, and a cause of disturbance."

to whom it is above all things to be desired that mind, will, thought, and paternal care over man should all be found hollow fictions, and that we should be ruled as metals and timbers are ruled, may naturally commend any triumph of resistless steel. But it is manifest under all this that the practical result of "emancipating" us from the care of our heavenly Father is not to be our subjection to the regime of "invariable" laws, with which no volitions interfere, but a result very different indeed. The consummation is to lie in our "irrevocable exclusion" from political power, simply because we believe in God, whether we be Deists, Catholics, or Protestants, followed by handing over the "general direction of our affairs" to Comte's priests of humanity. With his usual looseness, he does not say the general direction of "social" or "political," but of "terrestrial affairs." Now there are some terrestrial affairs respecting which I should demur to their being placed under the direction of the priests of humanity, on the ground of incompetency; such, for instance, as the weather at next seed-time and harvest, as the measure of sunshine next winter, and the number of earthquakes, the course of the winds, and the times and intensity of magnetic storms. Terrestrial affairs touch upon celestial relations at every point, and can never be within the ken of any priests of humanity, except to some such extent as the affairs of this kingdom are within the ken of the noble horses that parade in the park, taking a view of palaces, public offices, halls of legislature, and courts of justice, of rulers, judges, and legislators, and forming the best notions they are able of all these objects.

We are not to be left to the laws; that is common-sense, though contradictory to all theoretic Comtism. We are to have a providence; that too is common-sense. But what

is our providence to be? One that has to be "constructed at last." Constructed by the servants of humanity. Humanity itself did not construct the air we breathe; who knows that humanity could preserve it? Humanity did not construct the light and the dark; who knows that it could preserve them? Humanity did not construct the ground, or the water, or the sky; who knows that it could preserve them? Humanity did not construct humanity; did not construct the dust of the earth, or the green herb, or the beast of the field, or the ascending gradations of life and mind, or the interchanges of offices between different worlds on which humanity depends; who knows that it could preserve all these? You promise to construct for us a providence material, intellectual, and moral; but humanity did not construct matter, did not construct intellect, did not construct ordered relations or morals. Now surely humanity itself must be equal in power to the servants of humanity. If these last are to construct for us a new providence, whereof our fathers knew nothing, any more than ourselves in our early days, let them begin by constructing one living man for us, or by constructing out of cellular tissue either a mind or a body, without even setting the two in co-ordinated operation.

Society is only to be "reorganized;" this at least assumes that it is in existence. But providence is not to be reconstructed, but to be "constructed at last; this assumes that never yet has the "true" providence been in existence. We have heard what will happen to the larks when the sky falls; but what will happen to us all when the construction of a true firmament to cover our heads is to be undertaken by the larks, I, in point of fact, do not know.

These vaporous fictions are far outside of the pale of

reason, and are vastly more melancholy than would be promises made by a rudder to the ropes, masts, and sails, that if they could only emancipate themselves from the captain, they would "construct at last," what needs to come first, a providence to take the general direction.

The practical result remains, that in Comte's own hands laws with which no volitions interfere would not, could not work out the supply of human need and the performance of human functions. A providence there must be. Voltaire, with airy profanity, said that if there was not a God, you must invent one. Comte, with leaden profanity, says that as there never has been a true providence, he must construct one through his accredited priests of humanity. All who are not of their mode of thinking must leave to them the direction of affairs, and stand by, irrevocably excluded from government. And the hand of a Nicholas would be an honored instrument, the deeds of the 2d of December a "happy crisis," if they brought about the subjection of the "slaves of God," and the installation of the servants of humanity in the general direction of terrestrial affairs.

Of things admonitory, perhaps there is none so gravely admonitory as the spectacle of intellect rejecting and loathing all conception of an intellect higher than that of man, and then coming to "construct" what absolutely requires such Higher Mind. In comparison with a creature floundering in these fogs, how intellectually grand does old Laban seem, as, standing with his face turned again to his own East, while the young man is about to carry away to the mysterious West his daughters and grandchildren, he says, "The Lord watch between thee and me when we are absent one from another."

IX.

It is noticeable how complete is the absence in all the conceptions of the Bible of those petty notions which flit about in the heads of some thinkers as to relieving the Infinite One from finite cares, and equally complete is the absence of upside down notions about securing order by permitting Infinite Mind to retire from activity. The Hebrew, from Genesis onward, no more thinks of exonerating the all-present Watcher from cares by His ceasing to take charge of humble persons or mean animals, than he thinks of saving trouble to the sun by having grass-blades and wild flowers omitted from the list of things on which he shines; no more than he thinks of lightening the loads of the air by having small birds and insects "left" by it to inferior care; no more than he thinks of saving the sea from embarrassment by having the infinitesimal spawn of fish "left" outside of the circle of its attention. To him the difficulty of combining the particular with the general, and of simultaneously commanding both, was a difficulty of the finite being only. To him when the Infinite came in then did the distinction between great and little, between long and short, between general and particular, cease to be of account. To him "nature" included both the lifeless and the living; and the law, "Thou shalt not bear false witness against thy neighbor," was in the most august sense a law of nature, law unalterable, law for time and eternity, law for angels as well as men.

To him mind was the source and foundation of order; not the danger to be warned off, as if its helpless "caprices" must ever and only derange "laws." To him order was the calm witness to the constant activity of mind, and not the signature to its permit to leave off act-

ing. If the rising of the sun and his going down were not capricious but well-ordered, it was because mind made him to know his appointed times, and also to keep them. If the sea was not here to-day and there to-morrow, but remained steadily in the same bed, respecting its wonted limits, it was not because mind had retired in deference to laws, but because it had set up the decree and kept it up. If bird, beast, and man all found their suitable food lying day by day in the lap of nature; if rivers ran, and showers fell, and seasons went and came so as to minister to life and comfort, it was not because mind had taken itself out of the way of forces which knew nothing of themselves or their duties, but because all such forces were perfectly commanded. If the "voice of the Lord" terrified the deer, rent the tree, made hill, dale, and flood quake, it made the soul of man, harkening within the temple, say "Glory."*

If in those days there were men whose mental evolution had gone backward, they might have become so narrowed as to say, looking wise, "It is not the voice of the Lord; it is only detonation in the air, concussion of the air, causing a vibration of nerve and brain." And if in our day there are any who, being so superficial, fancy they explain things, they will perhaps deign to instruct us that our own voices are not our own voices, that they are "nothing but" detonation in the air, concussion of the air, causing vibration of nerve and brain. Among the beneficent offices of the thunder, none was so elevated as when it fulfilled the moral office of making the human intellect recognize the being of One whose tone could silence the voice of

* Psalm xxix. 9. "And in His temple doth every one speak of His glory."

every boaster, of making the human soul adore, and say "Glory."

The only explanation of existing order which can be justified by experience, or will bear reasoning, is that which accounts for it by the action of mind. And it must take into view, first, anticipatory action, by which mind can prepare various agents with the properties of each, can pre-arrange their forces, and can co-ordinate their actions to one future end; and, secondly, contemporaneous action, by which it can in continuity sustain what had been originated, and realize what had been designed.

Those sorts of explanation, which do nothing but enumerate the physical conditions preceding an occurrence, and then offer you this fragment of natural history as the "only scientific" explanation, though always found unsatisfactory, are of all ages. Their aim as used in our day—when used by men with sufficient insight to have a distinct moral aim—is simply to prevent any other glory appearing than that of men, such as those who make the explanation.

One morning an old man woke up in the condemned cell in Athens, and in the dim gray light saw a friend at his bedside. "What brings you here?" inquired the prisoner. "I come with serious news." "Ah! the ship is returned from Delos, and I am to die to-day." "No, not to-day, but to-morrow or next day. I, however," continues the friend, "have come to tell you that all is arranged for your escape; and for the credit of your friends and of the city, as well as for the sake of your wife and children, you must get up and flee with me." "No," replied the old man in chains—"No; unless the law releases me, I stay. The laws protected my birth, my growth, my marriage, my whole life. They now command my

death. Did I save my life by breaking them, and did I, like a runaway slave, find quarter somewhere, I should be haunted by the ghosts of the laws of my country, on which I had laid guilty hands."*

A morning or two afterwards the old man was seated on the edge of his prison bed, rubbing the leg from which the jailers had removed the chain no longer needed, and talking with several friends, whom even the cup of death could not drive away. He said, "Men who pretend to account for things by telling you that they are formed thus and thus, seem to me like a man whom I should ask to tell me why I am sitting bent here on this bed-edge, and who should reply, 'Because, O Socrates, the muscles and the nerves are bent so, and bend the bones so, and therefore are you sitting there so.' Nay, nay, that is no explanation. When you," looking at Crito, "proposed my escape, had I been possessed with the thought that it was right to escape, that thought would have carried off the bones, muscles, and nerves, and at this moment the whole of them would have been in Megara or somewhere else, not here. But I was possessed with the thought that it was right to abide the course of law; and that thought was the true cause of my being seated here."†

Here we have the modern question in ancient times. Here we have the vaporous explanation of every age. Here we have the answer that is ancient and modern, immortal and unanswerable. Physical forces are really masters of physical forces weaker than themselves; but they are the servants of mental and moral forces, and the fit instruments of mental and moral purpose. Under the rule of man they show forth the power of man. But, older

* The *Crito*.

† The *Phædo*.

than man, they took not their rise from his will; more widespread than man, they cease not where he ceases to be; more numerous than the discoveries of man, they never all meet under his eye; stronger than the will of man, they show forth a thought that is above his thought, a glory that is above his glory.

Comte dreamed that the old text, "The heavens declare the glory of God," had lost its value. Millions of men more than knew and loved it when he wrote know and love it to-day. Languages counted by tens that had never contained the text when he wrote, now publish it to new races. He dreamed that the heavens declared no glory but that of Hipparchus, Kepler, Newton, and other astronomers. How would the spirit of Newton have felt itself dwarfed and disinherited had any chill force contracted it into believing that the laws he reverently spelled out, in the book of the heavens and the earth, had never been written there by intelligent mind! That the adjustments he had delighted to contemplate from below had never been pronounced "very good" from above! That the steps on which he had been meekly and patiently climbing, steps which he had believed led him towards the throne of One to whose majesty space, filled with ten thousand-fold more stars than eye ever saw, was but as a goodly vesture, to be rolled up in time and changed—that these steps did not in reality lead to any unfathomable joy, but were nothing more than a steep stair winding up into the insupportable cold!

He only who is himself kept by the moral law can, like a rejoicing harvest-man, fully reap the benefits provided by the physical laws. Just as physical law works out its own fulfilment only because it is impressed upon the nature of the agents themselves which are its proper

subjects, so in a manner analogous does moral law fully operate then only when it is put into the mind of the agents properly subject to it, and written upon their hearts. Known it may be, and yet hated. Known with approval in the abstract it may be, and yet in practice outraged. But whenever a man desires to learn and obey, then can the Author of the law put its precepts into the mind, and write them upon the heart, imparting a good understanding of its scope, and a cordial sympathy with its blessed intent. He alone into whose renewed nature the grace of God has wrought the spirit of the moral law can really inherit the earth, filled with fruition of tranquil days and radiant nights, and large measure of immortal hope. For the pebbly roads of life, for the troubled fords of death, and for the unending travel of eternity, the feet need to be shod with the preparation of peace—peace that springs from good news of past sins forgiven, good news of a strong Friend who awaits one on every shore. For the battle with sin and sinful beings are needed the girdle of truth, the breastplate of righteousness, and the shield of faith, if at every turn of the struggle the head is to abide intact, covered with the shining helmet of salvation.

St. Paul, in one place, seems to rouse us up, as if we had bivouacked in the dark, had been revelling, and were now in slumber without thought of either combat or review. Wake up! he cries; wake up! it is high time to awake! Put on the armor of light. If this voice really does arouse some of us here—and the Lord grant that it may arouse not a few—we may all at once feel greatly at a loss. . . . Put on our armor? and it an armor of light, glinting brighter in proportion as the sun flames with fiercer exposure! Yes; let us put it on; but where, oh where to find it? Righteousness wanting, truth wanting, faith want-

ing, peace wanting, salvation wanting! All lost in the dark! Many a one may cry, "I have no armor to put on; and if once the sun is up, he will tell all without pity." To this muffled cry of moral destitution Paul has a brief reply, "Put on the Lord Jesus Christ." In putting on Him you put on truth and righteousness, faith, peace, and salvation. The mind of Christ is the sum of the moral law, the will of its Author, and the image of your Judge.

The same apostle sums up the features of the mind of Christ by stating what are the fruits of the Spirit, and concludes with a ringing axiom, which challenges the scrutiny of all science and of all practice: "The fruit of the Spirit is love, joy, peace, long-suffering, kindness, goodness, faithfulness, meekness, temperance: AGAINST SUCH THERE IS NO LAW."*

Against such no law! Bold word! Invincible word! against these lineaments of the image of God there is no law of the family, the happiness of which they will insure; no law of society, the relations of which they will sweeten; no law of the nation, the strength of which they will build up; no law of the race at large, the welfare of which they will enhance. There is against them no law of the body, which they will cover from many harms; no law of the emotions, for the peace of God will make them throb with equal pulse; no law of the intellect, of which joy in the Holy Ghost will make the working smoother; no law of the conscience, which may call for more of them, but never for less; no law of space, for goodness is good everywhere; no law of time, for righteousness is right forever; no law of the great white throne, for these are features that will shine bright in the light of it; no law of the

* Gal. v. 22, 23.

heaven of heavens, for there does the image of God find the Father's house. So, then, the conclusion of the whole matter is this: The mind of Christ is free of all worlds, and he who walks as He also walked is a citizen of the city of God.

THE END.

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